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THE MUSIC REVIEW

Edited by GEOFFREY SHARP

VOL. VII, NO. 1

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*Music and Elementary Theory of Numbers**

BY

BALTH. VAN DER POL

(freely translated by W. PROCTOR WILSON: February, 1945)

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| I. <i>Introduction</i> | V. <i>Consonance and dissonance</i> |
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APPENDIX: I. *The "Gradus suavitatis" of Euler*

2. *The Farey Series*

Introduction

IN what follows we are going to try to study the connection between music and the theory of numbers, and to account for what seems at first sight to be the paradox in their relationship. Music may be defined as an artistic expression of emotion, and mathematics as a cold science with dry formulae and a requirement of strict proof. But is there really a paradox here, if we go a little further? For music is, perhaps, the most beautiful of all the arts, and mathematics is probably the most beautiful of all sciences. The very abstract nature of both subjects is itself a common link, which may well have a deeper implication than we might at first imagine.

Is there really any essential difference between the inspiration that leads to the conception of a smoothly flowing melody, a pregnant theme, or an elegant modulation, and the one that conceives of a new, ingenious, and hitherto unknown mathematical relation leading to a new theory? Surely both arise in the same mysterious way, and both may lead to the difficult exploration of the recondite. The Dutch word "kunst", meaning "art", is derived from the verb "kunnen" to be able, and science implies ability.

Perhaps then, after all, a relation may exist between the Andante of Beethoven's fifth Symphony and the Theorem of Pythagoras. But there is a much more obvious and striking relationship between music and mathematics to be seen in the music of that famous master of counterpoint, Johann Sebastian Bach. In his works all the parts follow their strictly appointed paths, so much so that the alteration of a single note from its place in the composition nearly always spoils the whole work.

* A Saturday afternoon lecture at Teyler's Institute, Haarlem, on 3rd January, 1942.

The fugues of this master are worthy of study in this connection. The structure of these fugues is built up from the statement of the principal subject, followed by the answer in the dominant, that is, a repetition of the subject a fifth above the tonic. The original subject may then be repeated in another part, or there may be a number of counter-subjects, each of which is answered in its turn. Later we may have the "stretto", in which the interval between the subject and its answer is very much shortened. The master also makes use of "augmentations" and "diminutions", in which he assigns to some parts the task of playing the subject and answer in the original rhythm, while at the same time the remaining parts are playing the same subject at twice or half the set tempo. He also frequently "inverts" the subject, by converting upward intervals in the original downwards, and vice-versa. Such modifications of the original subject are introduced in every conceivable permutation and combination, and this interweaving of all the parts knits together a majestic whole, which reaches its climax with the final chord.

In that great work *The Art of Fugue*, which the master wrote in his later years, and never completed, a triple fugue is given, which is of so vast a structure and of so great complexity, that it can scarcely be interpreted into terms of sound. Of this fugue, Dr. Schallenberg says "It is intended to be read rather than to be heard. Here is music which there is no need to play". While I do not agree entirely with this statement, I brought it up because it gives an idea of the complicated structure of a work of this kind. And you will see that we have a case in which music and science are closely related to each other.

I must, however, warn you against one tendentious conclusion; you must not imagine that, just because there is a close relation between music and science, it will ever be possible to create a musical work of art by means of science. No mathematical calculation can explain, to give an example, the great musical effect that can be produced by a rest introduced in its proper place in a musical work—to the mathematician a rest is something which merely possesses the one-dimensional property of a finite length of time. We can, indeed, appreciate the effect of a rest, but not in any mathematical sense.

Nevertheless, the mathematician may attempt to analyse the works of the great masters of music. We do not agree with the poet Wordsworth that "We murder to dissect". I might add that the diametrically opposite view was held by his contemporary, Shelley. But we often find that some kind of analysis enables us to discover beauty in a composition that has not hitherto been noticed. And a closer insight, with a better understanding of a piece of music and of its general foundation and structure, will increase our pleasure and appreciation of the whole.

It is far from a coincidence that many intellectual people possess a knowledge of both music and mathematics. The mathematician speaks of harmonic analysis, harmonic functions, overtones, intervals and variations. It is certainly more than a matter of chance that the greatest of our mathematicians and physicists have interested themselves so much in the fundamentals of music. Look at the list of names: Pythagoras, Euclid, Ptolemy, Stevin, Mersenne,

Huygens, Euler, d'Alembert, Helmholtz and many others.* The work done by these scientists did not consist solely of studying the phenomena of tones; Euler and d'Alembert, for example, gave lessons in the tonic sol-fa, and in how to arrive at correct pitch intervals in singing. My own personal experience has shown me that there must indeed be a close relation between music and mathematics, for I have noticed that the combination of a love of music with a profound grasp of scientific principles is met with far more often than could be predicted statistically on a purely chance basis.

II—Time and rhythm

This relation is probably easier to understand than the foregoing general relationships, when we examine the texture of which music is made, that is, the notes or tones, with their great differences in length, timbre, intensity and pitch.

To begin with, let us consider the length or duration of the notes in music. The actual length of the note in time, expressed in seconds, is of course determined by the tempo and by the kind of note. The various notes—breves, semibreves, crotchets, quavers, semi-quavers, demi-semi-quavers are called in Dutch "whole notes, half notes, quarters, eighths, sixteenths, thirty-seconds". And we see that each is related to the next by the factor 2. The factor 3 also occurs in triplets and sextuplets. There is nothing new in the factor 4, it is simply twice 2. The number 5 is not met with so frequently in musical tempo, excluding passages where, for example, five tied quavers may be written instead of four. But we do find occasionally a rhythm based on the number 5, though not very often. It is found in cases where the composer uses the artifice of changing from $2/4$ to $3/4$, so producing very effectively $5/4$ time.

Examples of this are found in Tchaikovsky's sixth Symphony, and also in Spanish folk-dances. The number 6 is met with, of course, in sextuplets, and is also the characteristic of $6/8$ time; which, by the way, is not to be confused with $3/4$ —here is a case where twice three is not the same, musically speaking, as three times two. But at 6 we stop, because there is almost no case in which we find a tempo based on the number 7. There is an exceptional example among the works of Brahms.†

There is a very interesting appearance of the numbers 5 and 7 in musical tempo in the Adagio introduction to the last movement of Beethoven's first Symphony (see Fig. 1). In the passage quoted, the composer repeats the

* We may claim a place in this list, between Euler and d'Alembert, for an Englishman, Dr. Robert Smith, F.R.S. His achievement in determining, more than a century before Helmholtz, the rate of beating of tempered intervals, leading to his system of Equal Harmony as an improvement on Mean-Tone tuning, was described by L. S. Lloyd in *Phil. Mag.*, Vol. XXXIV, p. 472 (July, 1943) and p. 624 (September, 1943). Robert Smith's work is important, for, as Helmholtz pointed out, neither Euler nor d'Alembert mention beats in discussing consonance. Smith's *Harmonics* might have secured wider recognition abroad had it, like Euler's work, been published in Latin. [Ed.]

† Sir Adrian Boult suggests a note to the effect that $5/4$ and $7/4$ time are now more commonly encountered than Dr. van der Pol might lead the reader to believe. [Ed.]

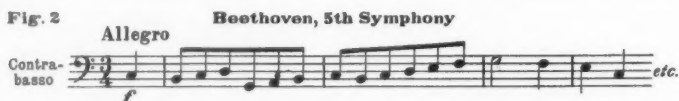
same motive, an ascending scale commencing on the dominant, in six consecutive bars, but in each successive bar this scale rises by one more note, until in the sixth statement we have eight notes altogether. You will see how the rhythm is set out, and you will notice that it falls naturally into shape by the use of the numbers 5 and 7. But it is obvious that these two numbers are very carefully used by the composer, who is consciously choosing a very precise phrasing allowing him to set out these six bars in terms of the numbers 2 and 3 alone.



The preference for the number 2 and its higher powers is also reflected in the number of bars required for the enunciation of a musical phrase, namely, eight. One cannot imagine a natural musical phrase consisting of seven bars.

Turning now to the length of notes in music, we may note that, as far as is known, there appears to be no numerical relation between the length of a note and its pitch. It is true that rapid passages are generally executed by the higher pitched instruments, apart from bass coloratura—but this does not mean that there is any numerical ratio between the frequency or pitch of a note, and its length; in other words, we cannot lay down any general rules for the number of vibrations that should take place in a note of given length.

Sometimes we meet rapid passages which are played by instruments of very low pitch. A typical example is the fugal entry of the C major trio in Beethoven's fifth Symphony (Fig. 2). Bearing in mind that the double-bass



sounds an octave below the notation shown in the music, it is quite a simple matter to calculate, knowing the tempo, how many vibrations take place during the brief time that these notes are sounding. In point of fact we find that each of these low notes only has time to complete some three or four vibrations. Now, from experiments that I have made, I have shown that this number of vibrations is not enough to permit anyone to recognize the pitch of a note. A special test carried out with the assistance of a double-bass player fully confirmed this fact; at the quick tempo of this passage it was not possible to recognize the pitch of the notes. But with that fine instinct and intuitive appreciation of the implications of acoustic ratios with which the master always scores his compositions, he scores in a violoncello playing the same passage an octave higher, and so eliminates the difficulty with one stroke.

It is noteworthy that in general we can tolerate much greater variations in tempo than in pitch. We are quite accustomed to frequent rallentandos and accelerandos as we pass from one tempo to another. The equivalent analogy to this, in terms of pitch, is the glissando. It is *a priori* clear that in such examples there is no question of an integral number of vibrations in a note. And even apart from such appreciable variations of tempo as these, there is still a considerable margin available for the performer in any incidental variations of tempo that he may indulge in. Such variations in tempo, compared with adventitious changes in pitch, of which we shall speak presently, are relatively large. We really need some standard means of comparison for the measurement of tempo, as distinct from pitch. As a type of standard for this purpose—though it is hardly generally accepted as such—the heart-beat or pulse occurs to one. And it is interesting to note that the Javanese word for rhythm, “ketek”, also means “heart-beat”. But there is some difficulty in adopting this means of comparison, because the average healthy man is not at all conscious of the rate of his pulse, or of any variation of the rate of his heart-beats, unless he observes them carefully. However, in point of fact, the percentage variations of the pulse rate, and for that matter, respiration rate, are much the same as those met with in musical tempo.

III—Absolute pitch

We shall now leave the subject of tempo, and go into what is meant by “pitch” in some detail. There are two quite different conceptions embraced by the term “pitch”, namely, absolute pitch and relative pitch.

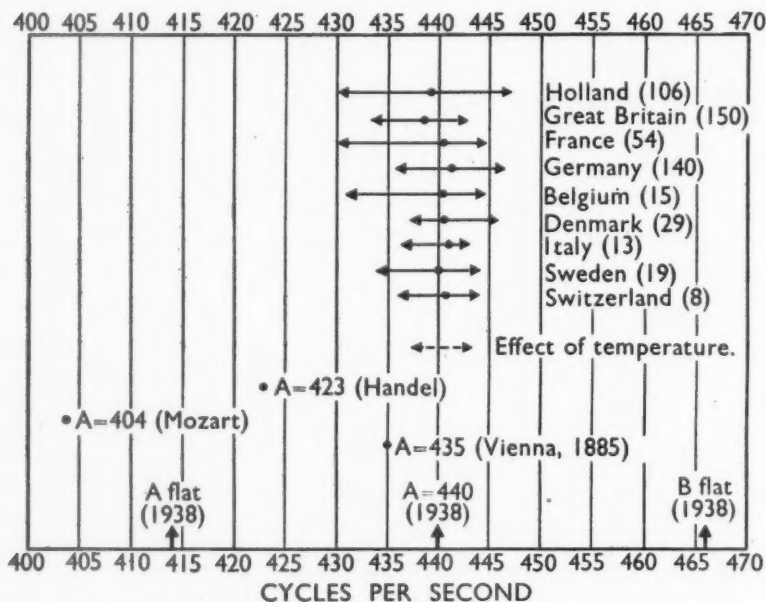
In order to illustrate the difference between absolute and relative pitch, we may compare the effects that are obtained with two gramophone discs, one of which is rotating at normal speed, while the other is going slightly too fast. In the former case, the number of vibrations recorded on the disc that pass under the needle is exactly the same, in a given time, as that emitted by the original composition, and it follows that the original pitch and tempo are both faithfully reproduced. In the latter case, the fact that the disc is going too fast implies that more vibrations are picked up by the needle in a given time than were produced by the music, the ratio of the vibrations to those recorded being a constant for all frequencies. Hence the pitch of the whole recording is raised, though the original ratio of all the notes in the composition remains unchanged; which is the same as saying that the intervals which are characterized by these ratios remain unaffected by the speed of the disc.

A true fifth will, therefore, remain a true fifth, although both of its components are raised in pitch. Hence an increase of speed raises the *absolute* pitch, while the *relative* pitch remains unaltered. At the same time, of course, the effect of running the disc too fast also increases the tempo above its correct value, but, as we have stated before, we are more tolerant of changes in tempo than in pitch. The experiment that we have just considered shows us the essential difference between absolute and relative pitch, and that they are mutually independent.

Now let us consider absolute pitch. This is defined entirely by the tuning

of a note, say A, to a definite frequency, that is, to a definite number of vibrations per second.

In the course of time, in different eras and in different countries, the pitch of A has been allotted different values; on the whole the tendency has been to raise the pitch, or tuning, steadily in an upward direction, because the feeling was rather that by so doing an increase in musical brilliancy was the result. This feeling is open to some doubt, however. Through this tendency many difficulties arose, since instruments with fixed tuning (such as keyed instruments), made in different parts of the world, could not play



The numbers in brackets after the name of the country refer to the number of measurements made.

Fig. 3

together, and sopranos and tenors rightly complained about the high pitch which was adopted by some orchestras. So, in 1885, at an international conference held in Vienna, it was decided to lay down a standard tuning for all musical purposes. The pitch chosen was A = 435 vibrations per second (cycles per second). It became obvious shortly before this war that the pitches adopted by the various countries and their orchestras differed among themselves to a considerable degree, and a new effort was therefore made to reach agreement on a new pitch. But the salient question was, how to choose it. A study was obviously desirable of the existing pitches in use throughout the world, so that the prevailing practice in respect of orchestras and keyed

instruments, such as organs, could be considered in choosing the new standard. Here a useful and welcome aid was available in the use of broadcasting.

In the laboratory at Eindhoven we made use of broadcasting technique in order to make measurements of the pitch of as many orchestras and musical instruments as we could. For this purpose we made up some special apparatus, the details of which need not concern us here, with the object of measuring the frequency or pitch of any note "A" that we could pick up by radio; provided that such a note remained sustained for over half a second its pitch could be determined very accurately. The results of this experiment revealed a considerable discrepancy in the tuning adopted by different countries, and similar experiments carried out in Germany showed that variations of as much as a semitone sometimes occurred. The results of these measurements are given in Fig. 3, in which the scale at the bottom of the diagram gives the number of vibrations per second, and the horizontal lines show the overall deviations of pitch observed in various countries. In Holland, the total number of observations made was 106, from which it was established that the pitch of A varied between 430 and 447 c.p.s.; similar results were obtained for other countries. In the lower part of the diagram are shown the relative positions in terms of frequency, *i.e.* pitch of the notes A flat and B flat for a given pitch of A = 440 c.p.s. The results depicted on the figure show clearly the wide variations of pitch that exist in various European countries. It should be added that the pitch of an orchestra may sometimes rise with increase of temperature (the piano is an exception), and it has been possible to show the magnitude of this rise in pitch as observed in practice (dotted line in the middle of the figure). The mean value of the pitch calculated from the readings taken for any one country is marked by a dot on the appropriate line in the figure.

In 1939 a stage had been reached, after preliminary discussions between musicians and technicians, at which agreement had been obtained to propose an international pitch of A = 440 c.p.s. for ratification. This pitch is 5 c.p.s. higher than that adopted at Vienna. In America this new value had already been adopted, and the standard frequency of 440 c.p.s. was transmitted from a special broadcasting station several times a day, so that uniformity of pitch could be attained throughout the continent. A similar procedure was also established in Germany some time ago. We see, then, that modern radio technique has provided us with a most efficient means of disseminating standard pitch with a very high degree of accuracy, whenever required.

As we have said, the pitch of musical instruments has been changed over a period of years, and it is interesting to see the difference between older and more modern practice. On Fig. 3 you will see that we have marked the pitches in use at the time of Handel, (A = 423) and of Mozart, (A = 404). So that what was an "A" in Mozart's time is now about half-way between A flat and G: that is to say, in Mozart's time the pitch used was no less than three-quarters of a tone lower than it is to-day. This fact brings up the question as to whether such changes in pitch as this can really be tolerated from both the technical and musical point of view with impunity. From the technical

aspect, it is a simple calculation to show that for the two values of pitch in question, the tension of the strings on the bridge of a violin will be respectively about 11 lbs. and 14 lbs.—a not inconsiderable difference. This is merely one example to show what can happen mechanically. But what is much more significant is the purely musical effect of the steady upward trend in pitch since Mozart's time. For example, the beautiful *Kleine Nachtmusik* used to sound three-quarters of a tone lower than it does to-day. Are there many musicians among us who will not whole-heartedly agree that it would be ridiculous to play this colourful, limpid music, which was so naturally written in the key of C major,* in either the sombre key of B major, or the dull key of B flat major? And yet, when it was composed, the music was played in something like these keys. In the light of this anomaly, it is even more difficult to assign any objective qualities to the characteristics which so many people ascribe to the various keys.

Let us now consider the question of pitch from the musicians' point of view. We may divide musicians into two classes, those with, and those without the sense of absolute pitch. By "absolute pitch" we mean the power of recognizing at any instant the exact pitch of any note, even when heard for the first time, whether this emanates from a noise in the water pipes, a squeaking hinge, a car horn, or an air raid siren. This sense is very different from that of *relative* pitch, in which if the pitch of *one* note be given, all other notes can be accurately recognized by comparison. And to some extent the recognition of the true pitch of a note can be acquired with some degree of accuracy, *e.g.* by imagining the highest note that one can sing, and then estimating the interval between this note and the one heard. But the true possessors of absolute pitch can identify a note immediately and naturally, as though it were the easiest thing in the world, just as anyone might be able to recognize and distinguish between yellow and red, or green and blue, or between the letters "p" and "q". Those who possess this sense find it a simple matter, if they understand a musical score, to follow and appreciate mentally a musical composition by reading it from the printed page, and as it were visualize each part in the correct pitch, and enjoy and understand the effects of each part, even if they have never heard the piece played. To them this is no more complicated than it would be for other people to read and appreciate a new poem.

It is curious that some of the greatest composers possessed this gift of absolute pitch to a very marked degree, while others were entirely without it. We know that Schumann and Wagner did not possess it, but that Mozart had it very highly developed. Intermediate cases seem to be rare; one either has this gift, or one has not. But we cannot say exactly what it really *is*, though we know what one can do when one has it. As far as we know, possessors of this sense always have it from their earliest youth. We know for example that the youthful Mozart once remarked that the "Butter Fiddle" (a name that he gave to a violin belonging to one of his father's friends because of its soft tone) was tuned a quarter of a tone lower than his own instrument. And

*Only the *Andante* is in C. [Ed.]

an equally developed sense of absolute pitch was enjoyed by the recently deceased Dutch composer, Johan Wagenaar.

I myself have possessed this sense since I was a boy, and I should like to tell you my own experience in connection with absolute pitch. When we had made the apparatus I have mentioned for the purpose of measuring the pitch

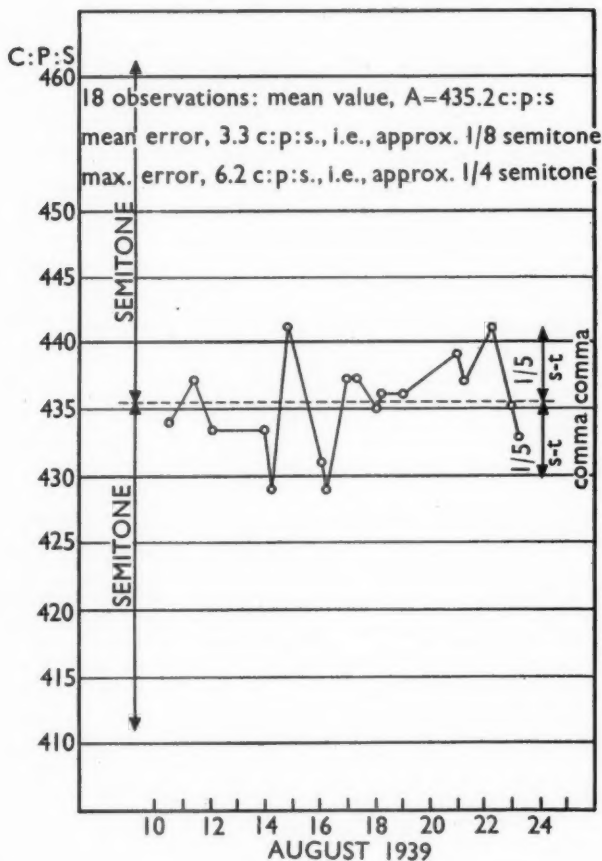


Fig. 4

of the various European orchestras, it was very easy at the same time to adapt it for the purpose of measuring the sense of absolute pitch. The apparatus could be set to give a note of any desired pitch, the value being read off on a scale marked with the frequency of the note, with an accuracy of the order of half a cycle per second. For testing my own accuracy, the apparatus was

worked by an assistant, and I used to come into the laboratory every morning and afternoon for a fortnight, and proceed as follows. The apparatus would be set to some arbitrarily chosen note, the frequency of which I was not told, and I then motioned with my hand to the assistant to raise or lower this tone until in my opinion it was exactly "A". The results of the experiment are seen on Fig. 4, on which the day of the month is shown horizontally, and the true value of the pitch which I adjudged to be that of A vertically. The mean value of the eighteen independent measurements that were taken gave a value of $A = 435.2$ c.p.s., with a mean deviation of 3.3 c.p.s., corresponding to about an eighth of a tone, or rather less than 1 per cent. The greatest error made was 6.2 c.p.s., corresponding to a quarter-tone, or just over a comma. My own impression has been for a long time that one can only attain as high a standard of precision as this if the note itself has a high harmonic content, but just what harmonics are concerned I do not know. It is, however, certain, and this has been confirmed by other possessors of absolute pitch, that our estimation somehow varied a trifle when one was very tired and then I always tended to find the pitch somewhat too high. This variation never turned out to be more than about a quarter of a tone, and so the accuracy does not seem to change very much—yet this variation was just enough to set one wondering about the pitch when one is listening to an orchestra which is supposedly playing at normal pitch, with the result that one's musical enjoyment is largely spoilt.

This adds force to the argument that, for possessors of absolute pitch, the exact choice of an international pitch is most important.*

IV—Relative pitch

So far, we have been discussing *absolute* pitch. Now I propose to consider with you a number of points in connection with the *relative* pitch of the various notes in polyphonic music. Obviously it is impossible to deal with the subject *in extenso* in the time that we have available, and so I shall confine myself to a number of points concerned with the close relation between music and numbers. We shall leave out such things as the practical possibility of constructing musical instruments with the octave divided into twelve or thirty-one equal parts. We shall just deal with a few abstract ideas.

First we distinguish between homophonic and polyphonic music. Now, as we have already heard, our ears are much less sensitive to small changes of pitch in notes played consecutively than they are to two or more notes sounded together. In polyphonic music, we are, therefore, much more concerned with the accuracy of relative pitch, or in other words, with the correct numerical ratios of frequency between the notes.

* Bachem's paper, embodying the results of his very full investigation of the genesis of absolute pitch, appeared in America in April, 1940 (*J. Acoust. Soc. Amer.*, Vol. XI, No. 4, p. 434), probably too late to reach Dr. van der Pol before the invasion of Holland. But it confirms and amplifies with a wealth of experimental observation all that Dr. van der Pol says here. [Ed.]

In broad outline, the musical intervals with which we are concerned are derived as follows (see Fig. 5). The intervals of the old Pythagorean scale

	c	d	e	f	g	a	b	c
Tempered	/	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	2
Pythagorean	/	$\frac{3}{2}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{2}{3}$	$\frac{3}{2}$	$\frac{4}{3}$	2
Diatonic	/	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{4}$	$\frac{9}{8}$	2

Fig. 5

were formed entirely from factors composed of powers of the numbers 2 and 3. All these intervals could thus be expressed by the product:

$$2^m 3^n$$

(where m and n are whole numbers, positive or negative). In other words, they are all derived from pure octaves ($2 : 1$), and from fifths ($3 : 2$), upwards or downwards.

A further step forward was made when Zarlino, in the year 1560, introduced the so-called diatonic scale (compare this on Fig. 5 with the Pythagorean scale); in this scale the prime number 5 appears as a factor. As a matter of interest Ptolemy also used this number. In the diatonic scale, we note that we have, amongst other things, a new third, C-E and a new sixth, C-A; these, as the diagram in Fig. 5 shows, do not differ very much from the Pythagorean third and sixth. The introduction of the number 5 means that we can now represent all the diatonic intervals by the expression:

$$2^m 3^n 5^p$$

The next natural number in order is 6; this is of little interest, since it is the product of the numbers 2 and 3, with which we have already dealt.

It is, however, quite another matter with the number 7. This number does not appear in the diatonic scale at all. It was left to the eminent Dutch physicist C. Huygens and the great Swiss arithmetician L. Euler to teach musicians to count up to seven. Euler's teaching was as follows: Since the diatonic major triad is given by the chord C-E-G, with numerical ratios of ($4 : 5 : 6$) why not add another note, corresponding to the number 7, thereby obtaining an unequivocal chord of the seventh ($4 : 5 : 6 : 7$), implying the addition of an Eulerian B flat, say B flat (Euler). If we were to start again, a fifth lower, and add an Eulerian F to the G triad, we should get the chord G-B-D-F (Euler), which would be related to the original C by the ratio F (Euler) : C = $21 : 16$; this F (Euler), however, differs appreciably from the F that we already know to be defined as the fourth above C. In fact we see by appropriate division that the ration between them is:

$$\frac{F \text{ (Euler)}}{F} = \frac{63}{64}$$

which is by no means an inconsiderable interval; it is for example greater than the greatest error made in the experiment on absolute pitch which I described to you just now. So the Euler seventh ($7 : 4$) sounds, as you will learn

presently, as a consonance, but to our ears it sounds decidedly too low for the seventh of the chord of the dominant seventh—this is due to the effect of the number 7. We can even explain this by saying that the Eulerian dominant seventh is *too* consonant, and so loses the character of the diatonic dominant seventh chord. The number 7 is carefully avoided in the design and construction of pianos in deciding where the hammers shall strike the strings, and the sounding of the Eulerian seventh thereby prevented. So many writers have come to the conclusion that there is no place for the number 7 in music. If we were to adopt a musical scale involving this number, our general expression for the intervals in it would be:

$$2^m 3^n 5^p 7^q$$

Going still further, we come to 8, which is the cube of 2; 9, the square of 3; 10, the product of 2 and 5, and the next prime number 11. Neither this number nor the higher primes appear in music as harmonic intervals as far as we know.

V—Consonance and dissonance

To sum up what has been said, the intervals of the diatonic scale have been shown to be determined by the ratios of relatively simple numbers. It is also true that the consonance of an interval increases as the numerical ratio of the frequencies of that interval becomes "simpler". By way of example, the octave (2 : 1), and the fifth (3 : 2) are very consonant; the major third (5 : 4), somewhat less so, while the major seventh (15 : 8) is decidedly dissonant, and the diatonic tritone:

$$B - F = (15 : 8) : (4 : 3) = 45 : 32$$

is even more so.

There is naturally a certain amount of arbitrary definition involved in these statements. For example, the Greeks used to regard the major and minor thirds (5 : 4) and (6 : 5), as dissonant, but we do not think so to-day. They also had the same opinion of the major and minor sixths (5 : 3) and (8 : 5).

We therefore require an answer to the question: "Can we express the quality of consonance objectively in terms of numbers?" Now, we know something of the very extensive work which Euler carried out in studying this subject in 1739. In fact an acquaintance, in the realm of music, with the investigations of Euler, who derived so many fundamental theorems in the theory of numbers, is doubly worth while.

Euler starts with the principle that something can be pleasing to us if we can recognize in it some regular rule or order, but is displeasing if no such rule or order exists. As an example, he gives the series of numbers:

$$1, 2, 3, 5, 8, 13, 21, \dots$$

At first sight this series appears to be a row of random numbers written down without any system; yet it will be seen that each number is the sum of the previous two. As soon as we notice this, we look at this series with, as it were, different eyes, and even find a certain elegance in it. If we now sound

two notes together, we shall find that we shall more readily be able to understand their combined effect if the ratio of the frequencies of these notes is expressible in simple numbers than we should if the ratio could only be expressed in large numbers. This amounts to the statement that in the former case the composite effect is recognized and understood more quickly than in the latter case. This concept of Euler agrees with that of Pythagoras; yet Euler goes further and develops a numerical rule of consonance, some eighty years before the enunciation by Fourier of his famous theorem.

Euler characterises every whole number "n" by what he calls its "grade", $G(n)$. One of the properties of the "grade" function is that the grade of a product "mn" can be expressed linearly in terms of the grades of m and n according to the expression:

$$G(mn) = G(m) + G(n) - 1 \quad (1)$$

Further, the grade of any prime number "p" is equal to the number, *i.e.*

$$G(p) = p \quad (2)$$

With these two definitions we are able to evaluate the grade of any whole number.

Now the connection between these "grades" and musical consonance is developed at great length by Euler in his *Tentamen novae theoriae musicae* written in 1739. In broad outline the principles laid down in this work are as follows:

Consider a chord $a : b : c : d$ — a, b, c, d , being whole numbers. We take first the lowest common multiple (LCM), which is obviously the lowest note which is an overtone of all four notes a, b, c, d . Euler called it an "exponent". Now consider the highest common factor (HCF) of these four numbers; this is the same as finding the highest note which is a common fundamental of a, b, c, d . Euler calls this an "index", and we will give it the name "fundamental". Obviously the "exponent" is a harmonic of the "fundamental"; let us call it the "n"th harmonic. Then by Euler's definition of degree of euphony, or euphonic value (*gradus suavitatis*), which we shall designate by the letter W , the euphonic value of the chord $a : b : c : d$, $W(a : b : c : d)$ is given by:

$$\begin{aligned} W(a : b : c : d) &= G(\text{LCM}(a : b : c : d) / \text{HCF}(a : b : c : d)) \\ &= G(\text{exponent} : \text{fundamental}) \\ &= G(n). \end{aligned}$$

Although in this example we have taken a chord of four notes, the principle applies equally to any number.

In the appendix will be found tabulated values of the function $G(n)$, and also of W for a number of intervals and chords, calculated on the above definitions.

Some immediate deductions from the above reasoning may be given as follows: Since the euphonic value W is least for the highest degree of concord, we see that two notes in unison, $(1 : 1)$ give the best concord, since $W = 1$.

Next in order comes the octave (2 : 1), with $W = 2$. Continuing further, we have the twelfth and double octave, with $W = 3$, followed by the fifth, with $W = 4$, and the fourth, with $W = 5$. The tenth and eleventh give $W = 6$. Then the major third, the major sixth, and the ninth all give $W = 7$. Proceeding still further, the minor third and sixth give $W = 8$, while $W = 9$ applies for the minor seventh, major triad, minor triad, etc. It can thus be seen that an objective criterion can be given for the degree of consonance of an interval or chord which agrees well with musical experience. So I feel that if we follow the path that Euler trod, we may perhaps be able to discover even more interesting facts and conclusions, and so perpetuate the memory of an almost forgotten investigation into the realm of music carried out by one of the greatest mathematicians of all time.

VI—Arithmetical series and musical scales

We now leave the investigations of Euler, and pass on to quite a different aspect of our modern diatonic major and minor third scales. I shall deal with this from the mathematical point of view, without using any musical premise. We must, therefore, clear our minds of certain assumptions which are so taken for granted that we may not find it easy to disentangle our ideas from them. First, we must forget, as we do in studying the theory of numbers, the decimal system to which we are all so accustomed, remembering that the choice of the number 10 as the basis of our counting is quite an arbitrary one. We must also disregard the significance of the octave as we know it in musical nomenclature and the picture of it continually repeating itself on a keyboard. Its special importance is justified in the theory of *harmony*, but does not arise in the theory of *melody*. Even in the time of the Greeks, the octave was not regarded as of special importance. Further, in what we are about to study from the mathematical aspect we shall not assume any prior knowledge of major or minor chords; all that we shall require is some knowledge of the simple properties of whole numbers and rational fractions.

We are going to examine the relation between the so-called Farey series and the musical scale, a relation which, as far as I know, has not hitherto been brought to light. Farey was a geologist who, in 1816, working along quite empirical lines, discovered some new properties in respect of arithmetical series of fractions; these properties were later placed on a rigorous basis by Cauchy. What Farey was considering in his researches was the general case of a series of simple fractions reduced to its lowest terms, in which the numerator and denominator contained numbers not greater than an arbitrary number "n". A series of Farey fractions $F(n)$, based on the above definition consists, therefore, of a series of fractions in ascending order of magnitude, and may well be illustrated by, say, the particular case of $F(8)$, which goes as follows:

$$\begin{array}{cccccccccccccccccccc} 0 & 1 & 1 & 1 & 1 & 1 & 2 & 1 & 3 & 2 & 3 & 1 & 4 & 3 & 5 & 2 & 5 & 3 & 4 & 5 & 6 & 7 \\ \hline 1 & 8 & 7 & 6 & 5 & 4 & 3 & 2 & 1 & 8 & 5 & 7 & 2 & 7 & 5 & 8 & 3 & 7 & 4 & 5 & 6 & 7 & 8 \end{array}$$

$$\begin{array}{ccccccc} 1 & 8 & 7 & & 7 & 8 & 1 \\ \hline 1 & 7 & 6 & \cdots & 1 & 1 & 0 \end{array}$$

In this series, in ascending order of magnitude, we have all the existing simple fractions in which no number exists greater than eight in the numerator and denominator. By "simple" fractions, we mean that such a fraction as $\frac{4}{8}$ is reduced to its lowest terms by factorization, and therefore appears as $\frac{1}{2}$. From his study of these fractions, Farey discovered the following elegant relationships which obtain for the general series $F(n)$: let us consider three consecutive fractions from the series $F(n)$, and let them be

$$\frac{p}{q}, \frac{p'}{q'}, \frac{p''}{q''}$$

Then the two equations (a) and (b) given below always hold:

$$(a) \quad p'q - pq' = 1$$

$$(b) \quad \frac{p + p''}{q + q''} = \frac{p'}{q'}$$

If, as an example, we take from the series given for $F(8)$ the three consecutive fractions:

$$\frac{3}{8}, \frac{2}{5}, \frac{3}{7}$$

then from (a); $2 \times 8 - 3 \times 5 = 1$

and also $5 \times 3 - 2 \times 7 = 1$

while from (b):

$$\frac{3 + 3}{8 + 7} = \frac{2}{5}$$

These properties hold, as we have said, for every pair and triplet of consecutive fractions in a Farey series of any order. Hence, if we eliminate from the above series $F(8)$, all the fractions in which the number 8 appears, we shall automatically obtain the series $F(7)$, in which equations (a) and (b) will still apply, a fact which is easily verified by inspection.

In the appendix we give some further general properties of these Farey fractions.

To come back to music, let us now consider the Farey series $F(5)$; it goes as follows:

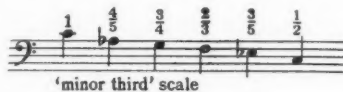
$$\begin{array}{cccccccccccccccccccc} 0 & \frac{1}{5} & \frac{1}{4} & \frac{1}{3} & \frac{2}{5} & \frac{1}{2} & \frac{3}{5} & \frac{2}{3} & \frac{3}{4} & \frac{4}{5} & \frac{1}{1} & \frac{5}{4} & \frac{4}{3} & \frac{3}{2} & \frac{2}{1} & \frac{1}{0} \\ \frac{1}{5} & \frac{1}{4} & \frac{1}{3} & \frac{2}{5} & \frac{1}{2} & \frac{3}{5} & \frac{2}{3} & \frac{3}{4} & \frac{4}{5} & \frac{1}{1} & \frac{5}{4} & \frac{4}{3} & \frac{3}{2} & \frac{2}{1} & \frac{1}{0} & \frac{1}{0} \\ - A b_2 C_2 F_2 A b_2 C_1 E b_1 F_1 G_1 A b_1 C & E & F & G & A & C' & E' & G' & C'' & E'' - \end{array}$$

We now observe that if we identify the middle fraction $\frac{1}{1}$ with the note C, the remaining Farey fractions, with the exception of the first and last, define the notes marked under the corresponding fraction. In this case, going

upwards from C we find that the fractions correspond to a scale of the major third:

	C	E	F	G	A	C'
I		$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	2

(See Fig. 6)



while going downwards from C we get a scale of the minor third:

	C	A \flat_1	G $_1$	F $_1$	E \flat_1	C $_1$
I		$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{3}{5}$	$\frac{1}{2}$

(See Fig. 6)

So, from purely mathematical considerations, we have arrived in one step at the definition of all the actually defined notes in the diatonic major and minor scales. Only those are omitted which, from the musical point of view, are less certainly defined, namely the second and seventh. In English these are called "mutable notes", because their value cannot be defined without further consideration. For example, the D defined as a fifth above the dominant G is quite a different note from the D defined as the fifth below the sixth, A, the ratios being respectively:

$$\frac{3.3.1}{2.2.2} = \frac{9}{8}, \quad \frac{2.5}{3.3} = \frac{10}{9}$$

and in the scale of the minor third two different sevenths exist.

Here is what Helmholtz says on the uncertainty about the pitch of the second and seventh: "The tuning of the second and seventh is in part variable"; while the composer and theorist Paul Hindemith is even more forceful in one of his recent works, when he says "The second and seventh are subjected to greater variations than all other intervals; they appear in melody and in harmony in innumerable gradations of magnitude." So we can say that the Farey series of order 5 leads us directly to all the notes of the major and minor scales, insofar as these are actually defined.

A further deduction of general musical interest is also to be derived from the Farey series, in that, independently of the order of the series, two consecutive fractions always correspond to the two consecutive harmonics or overtones of a common fundamental, and what comes to the same thing from the mathematical point of view, they also correspond to two "sub-harmonics" of a common "exponent". (See Appendix 2).

The Farey series F(5) can be represented visually by means of a large logarithmic slide rule, on the top scale of which are shown all the fractions, with the musical notes shown on the lower scale. By shifting the slide, the values of, say, the two seconds (10 : 9) and (9 : 8) are easily demonstrated, and other such intervals as the seventh, etc.

VII—Is *F sharp* higher or lower in pitch than *G flat*?

Returning to general principles, I should like to say something about the question that one often hears asked—"Is *F sharp* higher or lower in pitch than *G flat*?" In my opinion, it is impossible to give an unequivocal answer to this question, until we specify what we mean by the relation between *F sharp* and *G flat* on the musical scale, or take account of the conditions under which they appear. It may sound rather an aphorism if I point out that two *G* naturals need not necessarily be of the same pitch, as you will see from the musical example illustrated in Fig. 7. Consider the two simple modulations

Fig. 7

Modulation I: $C=1$, $G=3$, $D=\frac{9}{4}$, $G=\frac{81}{27}=3$, $G=\frac{81}{27}$

Modulation II: $C=1$, $G=3$, $C=2$, $A=\frac{10}{3}$, $D=\frac{20}{9}$, $G=\frac{80}{27}$, $G=\frac{80}{27}$

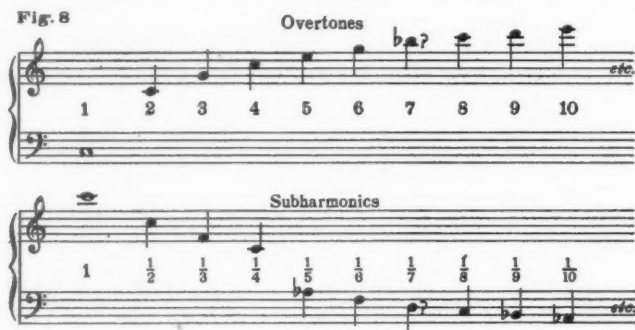
from the key of *C* major to that of *G* major shown in the figure; each of these leads to a differently pitched *G* on the basis of the diatonic scale. Studying Fig. 7, it is simple to see that while both modulations start from the same *C*, to which we assign the relative frequency 1, they lead to two different *G*s, related to each other by the factor $81:80$. These notes cannot of course be shown to be different if these modulations be played on a keyed instrument, such as the piano, but a good church choir singing unaccompanied should arrive at two different *G*s in the two cases illustrated. I do not know of any systematic experiments or test carried out in connection with modulations like these, but to my mind there can be little doubt about what the results would be. It would be of interest to see whether classical compositions always end in the same true key as that in which they begin. In some investigations that I carried out myself in this connection, I found that in Bach's music there was always strict agreement between the keynotes at the beginning and end of his pieces.

VIII—*Relaxation oscillations and sub-harmonics*

Finally, I propose to give you a demonstration of how to obtain mathematically exact intervals by means of what I have called "relaxation oscillations". These are periodic phenomena with characteristics diametrically opposed to those of harmonic oscillations, which have been the object of study for so many years. Without going into detail, I should like to say that I first began to

make a study of relaxation oscillations some twenty years ago under Lorentz during my three years at Teyler's Institute, when I turned my attention to the study of non-linear oscillations, such as those which are met with in radio technique. As so often happens, quite unforeseen paths lay before me, leading to unexpected destinations.

Many years before, the musician Hugo Riemann had shown that just as we can express the major triad C : E : G as the fourth, fifth, and sixth harmonics of a common fundamental, so we can regard the minor triad of F, going downwards from C, C : A flat : F, as the fourth, fifth, and sixth subharmonics of another note (see Fig. 8). It was not, however, possible experimentally to demonstrate these sub-harmonics, and this fact caused many



musicians and physicists to doubt the validity of Riemann's conclusions. But nowadays, with the help of relaxation oscillations, it is possible to demonstrate the presence of these sub-harmonics audibly, and to make use of the property of frequency division, one of the characteristics of relaxation oscillations which finds many applications in the physiological and technical field. If a "relaxation system" be controlled by a relatively high frequency ω , then the system can be set to select automatically a frequency at which to oscillate, the frequency being a mathematically accurate rational fraction of the controlling frequency ω , i.e. $\omega/1$, $\omega/2$, $\omega/3$. . . etc. These frequencies are sub-harmonics of the controlling frequency ω . By making our relaxation system yield successive sub-harmonics, we can play for example the minor F triad (going downwards from C, C : A flat : F), with the ratios ($1/4 : 1/5 : 1/6$). The sub-harmonics derived from an "exponent" C" are shown on the musical stave below.*



* Many readers will recognize in the lower notes of this series of sub-harmonics, taken in reverse order, one of the *harmoniai* discovered by Miss Schlesinger through "equal measures" on strings and equi-distant finger-holes on pipes (see Music Review, Vol. V, No. 1, p. 7, and her book *The Greek Aulos* (Methuen)). For them Dr. van der Pol's next paragraph, on melodic intervals, with its experimental demonstration, will have particular interest. [Ed.]

We see from this example, and we can hear it on the loud speaker, that the first five notes, shown as crotchets, with relative ratios ($1/2 : \dots 1/6$), all belong to the common chord of F minor. But you will once again notice that the seventh sub-harmonic does not belong to our musical scale. The note corresponding to $1/7$, which we have represented as E double flat, lies between E flat and D in pitch, and we have already shown that in chords this note does not give that of the dominant seventh. But, as we noted earlier, we are not so particular about pitch when we are concerned with melody, as opposed to polyphony, and *a fortiori* it is even more the case when we are concerned with passing notes or ornaments of a transient character. It can be shown, by means of a relaxation oscillator, that in these circumstances, a note determined by the number 7 can sound quite acceptable in its relation to other notes of the diatonic scale. I will demonstrate to you the first five bars of Grieg's "Morgenstimmung" from the first *Peer Gynt Suite* (see musical stave below), in which the notes corresponding to $1/6$, $1/7$, $1/8$ and $1/9$ are



used. You will observe that this sounds quite reasonable, even though the "third", E double flat to B flat, is somewhat too great, although the fifth, F to B flat, is naturally quite correct.

I have here two of these relaxation oscillators, both of which are controlled by a single high note, ω . By selecting from one oscillator a note ω/m , and from the other ω/n , we can obtain any two notes related by the whole numbers $m : n$, where m and n can lie between 1 and 100. By choosing $m = 5$, and $n = 6$, we obtain the pure diatonic minor third, or we can get the major third, and so forth, including the Euler seventh of which we spoke earlier in this talk.

IX—Variations of musical pitch

To sum up, we now come to the following conclusions: The exact relative pitch of a given note is dependent on the harmonic and melodic relation of that note with its context. Two modulations from the key of C to that of G can lead to different pitches of the note G, depending on the form of the modulation. Ideally speaking, this very fact implies that there must be variations in pitch, determined by subordinate relationships between notes, but, so far as I know, such relationships have been little or unsystematically investigated.

Yet just as the musician permits himself some freedom in tempo or rhythm in the interests of the interpretation of his art, he will also give himself, if his instrument allows it, some latitude in pitch, though it will be relatively small. To my mind, such variations of pitch are very much dependent on different kinds of music. In the classical music written by Bach, there should be no variation of pitch, while in later music, such as that composed by Wagner, an assertive high note of a soprano in an emotional forte may be sung up to a

quarter-tone sharp with advantageous effect. A Neapolitan sixth can be rendered appreciably flat with good effect, as it accentuates the peculiar characteristic of this interval.

Thus it can be quite correct, and even "very musical" to play or sing "out of tune", provided that it be done in the right way, which only good musical intuition can find. In such things as this science must keep silent and art alone may speak.

The musician can perhaps learn something from the man of science, but there is no doubt at all that the scientist can learn a very great deal from the musician.

APPENDIX

I. The "*Gradus suavitatis*" of Euler

Euler regards every natural number " n " as characterized by its "grade", $G(n)$. Since every natural number is composed of prime factors $p_1, p_2, p_3, \dots, p_m$, we can write:

$$n = p_1^{\alpha_1} p_2^{\alpha_2} \dots p_m^{\alpha_m},$$

where $\alpha_1, \alpha_2, \dots, \alpha_m$ are integers.

Example:

$$1200 = 2^4 \cdot 3 \cdot 5^2 \text{ hence } p_1 = 2, p_2 = 3, p_3 = 5$$

$$\text{and } \alpha_1 = 4, \alpha_2 = 1, \alpha_3 = 2.$$

Now Euler defines the grade $G(n)$ by the equation:

$$G(n) = \alpha_1 p_1 + \alpha_2 p_2 + \dots + \alpha_m p_m - (\alpha_1 + \alpha_2 + \dots + \alpha_m - 1) \quad (A)$$

Inserting into this equation the figures from the example above:

$$\begin{aligned} G(1200) &= 4 \times 2 + 1 \times 3 + 2 \times 5 - (4 + 1 + 2 - 1) \\ &= 8 + 3 + 10 - 6 = 15. \end{aligned}$$

As another example consider the number $24 = 2^3 \cdot 3$:

$$G(24) = 3 \times 2 + 1 \times 3 - (3 + 1 - 1) = 6$$

The definition (A) of $G(n)$ shows us immediately that the grade $G(p)$ of a prime number " p " is equal to p , *i.e.*

$$G(p) = p$$

and also that $G(n) - 1$ is an additive function; *i.e.* that if $G(m)$ and $G(n)$ are given, the grade $G(mn)$ of the product mn is given by:

$$G(mn) = G(m) + G(n) - 1.$$

Using the values of $G(1200)$ and $G(24)$ from the two previous examples, we get:

$$\begin{aligned} G(24 \times 1200) &= G(28800) \\ &= G(1200) + G(24) - 1 \\ &= 15 + 6 - 1 \\ &= 20. \end{aligned}$$

We could also have worked out this value of $G(28800)$ from first principles, using the definition at (A).

The definition of "euphonic value", or "gradus suavitatis" of a chord $(a : b : c : d)$ is given as:

$$W(a : b : c : d) = G \left\{ \frac{\text{LCM of } a, b, c, d}{\text{HCF of } a, b, c, d} \right\}$$

and may be simplified when the ratios of a, b, c, d , are given in their lowest numerical terms, because in this case the HCF of a, b, c, d , is unity; and the expression becomes:

$$W(a : b : c : d) = G(\text{LCM of } a, b, c, d).$$

Example:

Consider the major third triad in the form $(8 : 10 : 12)$, and derive its euphonic value.

The LCM of 8, 10, 12 is 120, and the HCF is 2.

Hence $\text{LCM}/\text{HCF} = 60 = 2^2 \cdot 3 \cdot 5$.

Thus $G(60) = 2 \times 2 + 1 \times 3 + 1 \times 5 - (2 + 1 + 1 - 1)$

$$= 9$$

$$= W(8, 10, 12).$$

If we compare this example with the case of the minor third triad, which we can write in its lowest terms as $(10 : 12 : 15)$, we find that here again we get the $\text{LCM} = 60$. Hence according to the Euler definition the same euphonic value applies to both major and minor third triads.

It is easy to show that in general the euphonic value of any chord of the form $(a : b : c : d)$ is equal to that of the "mirror-image" chord $(1/a : 1/b : 1/c : 1/d)$.

For convenience in calculating the value of W , a short table of $G(n)$ is given below (Table I).

TABLE I

n	$G(n)$	n	$G(n)$
1	1	16	5
2	2	17	17
3	3	18	6
4	3	19	19
5	5	20	7
6	4	21	9
7	7	22	12
8	4	23	23
9	5	24	6
10	6	..	..
11	11	30	8
12	5	..	..
13	13	60	9
14	8		
15	7		

The euphonic values of a number of chords and intervals are given in Table II. The first column gives the nomenclature of the intervals or chords, the second the corresponding frequencies in their lowest terms. The third and fourth columns give respectively the LCM and the euphonic value W .

TABLE II

Interval or Chord	Ratios	L.C.M.	Euphonic value W
Unison (C : C)	1 : 1	1	1
Lesser major second (D : E)	10 : 9	90	10
Greater major second (C : D)	9 : 8	72	8
Minor third (C : E \flat)	6 : 5	30	8
Major third (C : E)	5 : 4	20	7
Fourth (C : F)	4 : 3	12	5
Fifth (C : G)	3 : 2	6	4
Lesser sixth (C : A \flat)	8 : 5	40	8
Greater sixth (C : A)	5 : 3	15	7
Euler seventh (C : B \flat (Euler))	7 : 4	28	9
Lesser seventh (D : C)	16 : 9	144	9
Greater seventh (A : G)	9 : 5	45	9
Augmented seventh (C : B)	15 : 8	120	10
Octave (C : C')	2 : 1	2	2
Ninth (C : D')	9 : 4	36	7
Tenth (C : E')	5 : 2	10	6
Eleventh (C : F')	8 : 3	24	6
Twelfth (C : G')	3 : 1	3	3
Thirteenth (C : A')	10 : 3	30	8
.....
Fifteenth (C : C')	4 : 1	4	3
.....
Diatonic tritone (F : B)	45 : 32	1440	14
Euler tritone (F (Euler) : B)	10 : 7	70	12
Inversion of diatonic tritone (B : F)	64 : 45	2880	15
Inversion of Euler tritone (B : F (Euler))	7 : 5	35	11
.....
Major triad (C : E : G)	4 : 5 : 6	60	9
Minor triad (C : E \flat : G)	10 : 12 : 15	60	9
2nd inversion of major triad (G : C : E')	3 : 4 : 5	60	9
2nd inversion of minor triad (G : C : E' \flat)	15 : 20 : 24	120	10
1st inversion of major triad (E : G : C)	5 : 6 : 8	120	10
1st inversion of minor triad (E \flat : G : C)	12 : 15 : 20	60	9
Diatonic dominant seventh (G : B : D' : F')	36 : 45 : 54 : 64	8840	17
Euler dominant seventh (G : B : D' : F (Euler))	4 : 5 : 6 : 7	420	15

In Table II certain intervals are given in which the ratios involve the number 7. If, for example, we compare the diatonic tritone (45 : 32) with the Euler tritone (10 : 7), we shall see that in the former the euphonic value is 14, while in the latter it is 12, so the Euler tritone appears to be more consonant than the diatonic. In the same way, the Euler dominant seventh chord (4 : 5 : 6 : 7), with its euphonic value of 15, is more consonant than the diatonic equivalent (36 : 45 : 54 : 64) with a value of 17. But this does not conflict with the statement that the effect of *sounding together* the notes of the chord of the dominant seventh (it will be remembered that the ear is much more sensitive to the exactness of intervals between notes sounded together rather than played successively) is to make the Euler version sound too low.

6	.	.	.	.	.	.	.
5	.	$\frac{5}{1}$.	$\frac{5}{2}$.	$\frac{5}{3}$.	$\frac{5}{4}$.	.	.
4	.	$\frac{4}{1}$.	.	$\frac{4}{3}$.	.	$\frac{4}{5}$.	.
3	.	$\frac{3}{1}$.	$\frac{3}{2}$.	.	$\frac{3}{4}$.	$\frac{3}{5}$.	.
2	.	$\frac{2}{1}$.	.	$\frac{2}{3}$.	.	$\frac{2}{5}$.	.
1	$\frac{1}{0}$.	$\frac{1}{1}$.	$\frac{1}{2}$.	$\frac{1}{3}$.	$\frac{1}{4}$.	$\frac{1}{5}$.	.
0	0.	$\frac{0}{1}$.	.	.	.	.	.
	0	1	2	3	4	5	6

Farey points.

Fig. 9

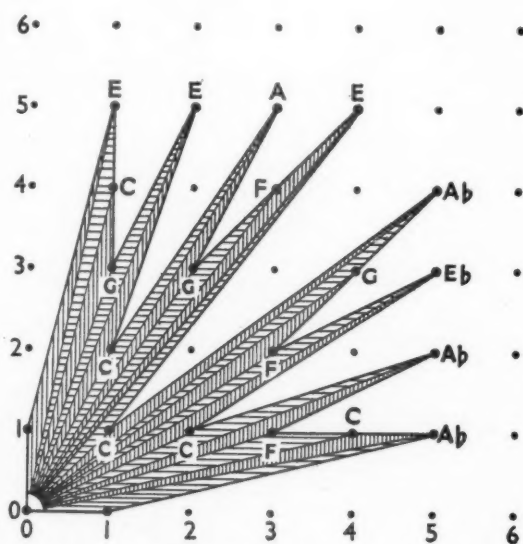
*Farey triangles.*

Fig. 10

In fact the Euler dominant seventh just loses that dissonant characteristic which we associate with the dominant seventh, which makes it demand resolution into the common chord.

2. The Farey Series

In addition to the two properties of the Farey series given in the text:

$$(a) p'q - pq' = 1$$

$$(b) \frac{p + p'}{q + q'} = \frac{p'}{q'}$$

there may be added two more, in that part of the series in which proper fractions appear: i.e. $p/q < 1/1$:

$$(c) q + q' \text{ is always greater than } n$$

$$(d) q \neq q'$$

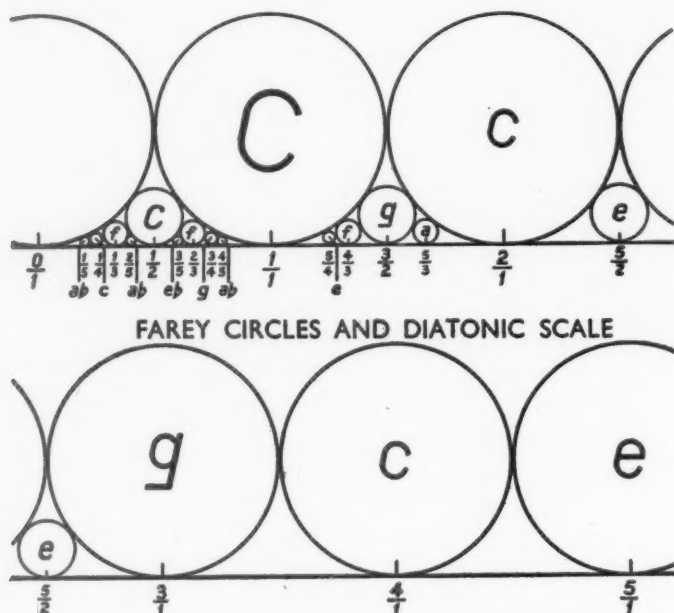


Fig. 11

If we represent the Farey fractions graphically at points on a rectangular lattice of "unity" mesh, and relate the numerator to the ordinates, and the denominator to the abscissa (see Fig. 9, in which this has been done for $F(5)$), and then join the Farey points so obtained to the origin with straight lines, we shall find that triangles are formed by two successive Farey points and the origin. (See Fig. 10).

ERRATA

The first equation on page 25 should read:

$$\frac{T_{m+1}}{T_m} = \frac{\frac{p'}{q'}}{\frac{p}{q}} = \frac{p'q}{pq'} = \frac{pq' + 1}{pq'}$$

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These triangles possess the following properties:

- (e) No other point in the lattice lies within any of these triangles.
- (f) The areas of all the triangles are equal to $\frac{1}{2}$.

A recent study by L. R. Ford in the *American Math. Monthly* (Vol. 45, p. 586, 1938) has brought further interesting properties of these fractions to light. Let the fractions of a Farey series $F(n)$ be plotted linearly along a horizontal axis, so that lengths are set out proportional to p/q , p'/q' , p''/q'' , etc. Now construct above this axis for each value of p_n/q_n a Farey circle of radius $1/2q_n^2$, touching the axis at each Farey point.

We then have the following theorems:

- (g) all Farey circles lie outside each other, and hence never intersect.
- (h) Farey circles corresponding to successive Farey fractions touch each other.

The Farey circles so obtained for $F(5)$ are shown as an example in Fig. II.

On the diagram the appropriate musical notation is shown, relative to the circle corresponding to $1/1$ which is designated C. We can see immediately from this figure the implication in theorem (h), and also the property possessed by these fractions that successive terms are also successive over-tones of a common fundamental. It will be seen that C and F' , C and G' , but not C and A' , are successive harmonics, since the corresponding circles for C and F' , and C and G' touch each other; this is not the case with the circles corresponding to C and A' .

The proof that successive Farey fractions are also successive over-tones of a common fundamental may be given in the following simple form:

We take an arbitrary term from the series $F(n)$, $T_m = p/q$, and the succeeding term $T_{m+1} = p'/q'$.

We then have:

$$\frac{T_{m+1}}{T_m} = \frac{\frac{p'}{q'}}{\frac{p}{q}} = \frac{p'q}{pq'} = \frac{pq' + 1}{pq'}$$

in which the last step follows from relation (a). T_m and T_{m+1} are thus successive over-tones of a common fundamental.

We also have:

$$\frac{T_{m+1}}{T_m} = \frac{p'q}{pq'} = \frac{p'q}{p'q - 1}$$

from which it follows that T_m and T_{m+1} are also successive sub-harmonics of a common "exponent".

Finally, it is self-evident that these properties of Farey fractions which have been given here are not mutually independent.

Italian Traits in the English Madrigal

BY

EVERETT B. HELM

THE remarkable flowering of the Elizabethan madrigal can only be understood in relation to the contemporary music of Italy. I propose, therefore, briefly to indicate the relationship between these two countries in the sixteenth century and then proceed to specific cases and illustrations.

The best of English culture in the Elizabethan period depended largely upon Italian models. English dependence upon Italy reaches far back into the early sixteenth century when English scholars and men of letters began to turn more and more to Italy for guidance and inspiration and when young men of good family were sent in increasing numbers to Italy to complete their education. Castiglione's book, *The Courtier*, an encyclopaedic manual of behaviour in polite society, was early translated into English and became widely accepted as authoritative. (It will be remembered, incidentally, that Castiglione insists that the perfect gentleman shall be well-trained in music.)

From the time of Henry VIII, Italians were found in considerable numbers at the English court, which was the focal point and model of English society. There were musicians among them, although none of great importance—not even Alfonso Ferrabosco I, who came to England before 1562. It seems probable that the Italian influence in English music, as in English literature, came decidedly more from Italy itself than from Italian residents in England.

The point is, however, that in the course of the sixteenth century, the English became more and more aware of the culture of Italy and reflected it in their own somewhat belated Renaissance. The importance of Italy in English literature has been well established. Without Petrarch there could, one might say, have been no Wyatt and no Surrey. Without Ariosto and Tasso, Spenser's *Faerie Queen* could scarcely have been written. Sidney, too, while protesting against English imitators of Italian models, is heavily indebted to the Italians. Even Shakespeare, the most English of all, owes a great deal to Italy. These are only the greatest of the English authors; an infinite number of lesser lights might be named, who borrowed, copied, and plagiarized from Italian literature.

In the best literature of the time the borrowing was of two kinds—that of form and that of spirit. Neither of these borrowings was in any way fatal. The use by Englishmen of Italian forms lent a grace and a suavity to the technical apparatus of poetry. The infiltration of the spirit of the Italian Renaissance stimulated the native English vigour and freshness into new realms of expression. Only when the actual material of Italian literature is borrowed, or rather stolen, by a person unable to "transmute" it into English, does the English become a mere copy. The best Elizabethan literature is a happy amalgam of Italian technique and artistic suavity with native English

purity and energy, which was at that time great. The finished product became no mere exotic importation because of its Italian borrowings, nor was it in any way weakened. On the contrary, there is no greater proof of English vigour at this time than the ability of the English to take over foreign forms and techniques and employ them to their own highest advantage.

In music the situation is similar to that of literature, except that the Italian influence appears later, more suddenly, and more emphatically. Only toward the end of Elizabeth's reign, years after the *poets* had appropriated Italian models, does Italian music make itself felt in England—at least to the extent of greatly influencing English composition. Then suddenly it is there, and dominates the scene. Why this happened just when it did is not readily apparent. But to understand how it happened so quickly is an easier matter. It *could* happen quickly because the English appropriated from the Italians, ready-made, the forms and the idioms of secular music which the Italians had already brought to a point of perfection. In so doing they preserved even the Italian names, which they merely Anglicized: Madrigal = Madrigale; Canzonet = Canzonetta; Ballet = Balletto.

No attempt will be made here to treat in detail the question of madrigal texts. In general it may be said that the entire English madrigal, as concerns the texts, is more or less inspired by the Italian, employing many of the same phrases, similar conceits, and often following the same general patterns. It differs, however, in being less elegant, less sophisticated, but often correspondingly fresher. It is to be regretted that the English did not follow the lead of the Italians in one respect and set the words of their own great poets. We have Italian settings of Dante, Petrarch, Boccaccio, Bembo, Tasso, Ariosto, Sannazzaro; but no Englishman set Chaucer, Surrey, Spenser, Sidney, or Shakespeare. Also in another respect the English lag behind the Italians. The English produced not a single work comparable to the magnificent cyclical compositions of the Italians, such as the canzone of Petrarch or the connected stanzas from Ariosto.

It is interesting to note in passing that the earliest publication of William Byrd, the least Italianate of the English madrigalists, contains a setting of an Italian text—a stanza from Ariosto beginning "La virginella è simil'alla rosa". This is not the only instance of an English composer setting a text in Italian. Thomas Weelkes' *Ayres and Phantasticke Spirites* contains two pieces on Italian texts.

Many texts used by the English madrigalists are translations or paraphrases of Italian models. Fellowes cites the sources of some of these in the prefaces to the various volumes of *The English Madrigal School*. Particularly Morley and Wilbye made use of such adaptations. This subject is treated in more detail by Alfred Einstein in an article appearing in the April, 1944 issue of *Music and Letters*.

Before turning to the English madrigal it will be well to consider briefly the Italian madrigal and its related forms. Toward the end of the sixteenth century, the Italian madrigal and the lesser Italian secular forms (particularly villanella, canzonetta, and balletto) tend to approach each other in concept,

style, and technique. The madrigal becomes less serious, generally speaking (there are, of course, exceptions), both as regards the subject matter of the texts and the musical substance. The sober, almost scholarly musical approach of Rore, Willaert, and Palestrina gives way to the lighter treatment of Marenzio, Vecchi, Croce, and many lesser contemporaries. The earlier technique of motet-like imitation alternating with broad declamatory passages is replaced by a technique of short, light points of imitation alternating with passages in parlando-like recitative. Particularly the "concertante principle", in which a short, quick motive is repeated alternatively by two or more voices at the same pitch, is cultivated almost to the point of affectation. The even rhythmic continuity of the early and middle period madrigal gives way to striking alternations of metre and of implied tempo resulting from sudden changes from long to short notes, or vice-versa. Chromaticism, long a feature of madrigal style, is pushed to ever greater extremes, culminating in the amazing works of Gesualdo.

The changes just described all result from the paramount desire on the part of Italian madrigal composers to express as dramatically and closely as possible the sense of the text. In the earlier stages of the madrigal, such expression was accomplished without breaking the musical continuity—it was accomplished, so to speak, *within* the musical framework. As the century wore on, however, the quest after ever-more-dramatic expression led composers to more extreme practices. By the last decade of the century text expression so far dominated the minds of composers that the madrigal became a series of nearly independent passages. These passages were connected, to be sure, by the continuity of the poetry, but they were at the same time separated and even dispersed by the attempt, not only to mirror the changing moods of the text, but also to illustrate each and every physical object mentioned in the text and susceptible of musical portrayal. Thus the form of a hypothetical madrigal may be simply: lamenting, running, high, sighing, bitter, mountains, and dying, as each of these words appears in turn in the text. In a sense it is the high degree of musical concentration of the composers (such as Marenzio, Gesualdo, Vecchi, Rore, A. Gabrieli, *et al.*) which holds these late madrigals together. One must add to this as a cohesive factor, however, the large number of accumulated formulae and practices which had been worked out by hundreds of composers in the course of the century.

In the expression of light, gay sentiments, madrigal style borrowed principally from the canzonetta and balletto. This stylistic combination may be seen in the works of Marenzio, where it produces a most charming effect, and even more clearly in the music of Vecchi and Striggio.

At the same time the canzonetta, an outgrowth of the earlier canzon villanesca, approaches more closely to madrigal style. Around the middle of the century, a wide gulf had existed between madrigal and the lesser secular forms, the latter being simple in form, content, texture and musical procedure. By the end of the century they had acquired many characteristic features of the madrigal, including greater length, increased use of imitation, a tendency toward word-painting, a richer texture. They had dropped, moreover, a

feature which once characterized them—a kinship with popular music, marked by the use of parallel fifths as an integral part of their style. From the balletto, the madrigal adopted rhythmic passages in triple metre, note against note; and conversely, from the madrigal the balletto adopted a somewhat more learned style.

It will be seen, then, that around the years 1580–1600 the names of Italian secular forms designated less definite stylistic and formal distinctions than formerly. Witness to this fact is born further by the titles given to collections of “madrigals” of this period; *Li Amorosi Ardori di diversi Eccellentissimi Musici* (1583); *Symphonia Angelica di Diversi Eccellentissimi Musici* (1585); *Armonia di Scelti authori* (1586); *Ghirlanda di Fioretti Musicali* (1589), etc.

It was in this somewhat confused condition that the English took over the Italian secular forms. The English even accentuated this heterodoxy. Both as regards style and form it is frequently impossible to distinguish between the English madrigal and canzonet. Many of Morley's three-voice canzonets¹ are longer and in style more madrigalesque than some of Wilbye's three-voice madrigals.² Even the mood of the two forms is interchangeable. The canzonet need not be light nor the madrigal serious, although this distinction prevails in general. The English canzonet, moreover, sheds another characteristic Italian feature in becoming Anglicized—it is no longer necessarily a strophic form, but like the madrigal may be through-composed. The Ballet is in the same uncertain condition. Some Ballets preserve the traditional structure: division into two halves, each ending in a fa-la or similar refrain, with each half repeated; two or more stanzas, each sung to the same music; a general mood of gaiety. English Ballets exist, however, in which there is no fa-la or other refrain,³ only one stanza of text exists;⁴ and the mood is far from gay.⁵ In fact, the only distinguishing feature of certain ballets of Morley is the division of the piece into two halves, each of which is repeated. In other respects they are madrigals, or canzonets, or what you will.

The collection published by Weelkes under the title *Ayres and Phantastickes* for three voices presents a particularly interesting problem of form-distinction. Here various characteristics of all three forms are commingled in a truly original way. All are comparatively short; most are strophic; the majority are in two halves, each half repeating; and most are peppered full of fa-las. In these respects they resemble a composite form of canzonet and ballet. In their style, however, they frequently employ typical madrigalistic idioms and figures, thus creating a combination which produces some fascinating, thoroughly English results.

¹ E.g. *Deep Lamenting*, No. 9 in Fellowes' *The English Madrigal School*, Vol. I: Thomas Morley. Canzonets for Two and Three Voices, 1593.

² E.g. *Away, Thou Shalt not Love Me*, No. 2 in Fellowes' *The English Madrigal School*, Vol. VI: John Wilbye. First Set of Madrigals, 1598.

³ Morley Nos. 16–20 inclusive in Fellowes' *The English Madrigal School*, Vol. IV: Thomas Morley. Ballets for Five Voices, 1595.

⁴ *Ibid.* Nos. 16–20 inclusive; and Weelkes Nos. 14, 16, and 17 in Fellowes' *English Madrigal School*, Vol. X: Thomas Weelkes. Ballets and Madrigals to five voices, 1598.

⁵ Weelkes No. 16 as in footnote (4), and Morley Nos. 19 and 20, as in footnote (3).

Mention has been made of the Italian attitude toward the text. The English too are interested in text illustration—some more than others—and they appropriate from the Italians many of their illustrative techniques. But they add to this a tradition for song-like melody—for “ayre” which goes back to remote times (e.g. Summer Canon) and which has always been a characteristic feature of English music.

In thus modifying the Italian style they arrive at a style of their own which, though borrowed, may still be said to be original in the sense that Spenser and Sidney are original. The originality lies clearly not in the forms nor even in the devices and techniques employed. It lies rather in the composers themselves and in the spirit in which they approached their work. In the sociological sense this difference is that between Italian and English societies with their different points of view. In the more personal sense, it is the difference between composers who are citizens of a country on the wane and those of a country on the rise, with its accompanying freshness and enthusiasm. The Italian madrigal was written by highly sophisticated men for a refined and somewhat decadent society. It abounds in subtleties which the English could not comprehend. The English madrigal is more forthright, more lyrical, more “human”.

This contrast shows itself also in two musical characteristics. The English madrigal is more objectively constructed than the Italian. It is more a unified whole, with a prevailing mood and movement rather than a constantly varying series of contrasting episodes. In this sense it is less dramatic than the Italian. The second chief point of contrast is also bound up with the dramatic element, or rather the absence of it. Rarely does the English madrigal contain any passages in “choral recitative”—the declamatory passages so common in the Italian madrigal as a herald of the birth of opera.

The first publication of English secular music was Thomas Whythorne's *Songs for Three Fower and Five Voyces* of 1571. In this work there is no hint of madrigal style. It is a collection of harmonized songs, in the true English tradition. Only after 17 years do further secular works appear (and this at a time when Italy was printing madrigals by the thousands). In 1588 Byrd published his collection *Psalms, Sonets, and songs of sadness and pietie*. This work contains no *bona fide* specimen of madrigal style; the closest approach is *La Virginella*, already mentioned. The music appears much more a continuation of the manner of Whythorne. The pieces are constructively built, without great attention to word-painting. In some pieces one voice is designated (by Byrd) “the first singing part”, and it carries the principal melody. It enters last, as in a chorale-prelude; the other voices prepare and support each song-like phrase of the “first singing part”. Almost without exception this part is the soprano. Byrd's own preface states: “heere are divers songs, which being originally made for instruments to express the harmonie, and one voyce to pronounce the dittie, are now framed in all parts for voyces to sing the same”. Such a method is the antithesis of madrigal style, in which all voices share equally in importance, and in which text expression by all the voices is the aim.

The surpassing beauty of this music of Byrd rests on an entirely different, and in a way more wholesome aesthetic.

The same year as Byrd's "ice-breaker", a book appeared which was of paramount importance for music in England. This is the collection *Musica Transalpina*. It contains 57 Italian madrigals with (badly adapted) English translations. I do not suggest for a minute that this book created a vogue for the Italian madrigal in England. On the contrary, it supplied an increasing demand. The preface itself states that Yonge had received each year books of Italian madrigals which were "for sweetness of aire, verie well liked of all".

But the *Musica Transalpina* undoubtedly influenced the direction of the English madrigal and helped to shape its style. It is significant to notice which composers are represented. First comes Ferrabosco with sixteen madrigals. Despite the number of his compositions, his importance to the English madrigal was not great. It is likely that he was so amply represented because he had lived in England and had held a pension from the Queen. His music is not of the first order—inferior indeed to the rest of the collection and to subsequent English composers. It is technically weak and spiritually uninspired. Much more important are the ten madrigals by Luca Marenzio, of whose importance I shall speak presently. Then there are five by Palestrina; four by Monteverdi, three by Conversi, two each by Byrd and Lasso, and a number of single pieces by other Italian composers.

The next publication of secular works was the *First Set of Italian Madrigals Englished, not to the sense of the original dittie, but after the affection of the Noate*, by Thomas Watson. There are also here inserted two excellent Madrigalls of Master William Byrd's composed after the Italian vaine at the request of the said Thomas Watson, 1590. This publication contains 28 madrigals of which 23 are by Marenzio. It is clear that Marenzio's popularity was great. The dedication to Marenzio in Watson's publication is extravagant: "The sweet power of your music stabs me; so may I die often, for in your song is life. When you sing, I dream it is the music of the spheres, the harmony of the Muses." Morley, in his *Plaine and Easie Introduction to Practicall Musicke* (1597), recommends Marenzio "for good ayre and fine invention". Peacham writes in *The Compleat Gentleman*: "For delicious Aire and sweet Invention in madrigals, Luca Marenzio excelleth all other whosoever."

In the decade following the publication of these two books, a considerable bulk of the English madrigal literature was produced—more than in any other decade which was to follow. To give a complete picture of this literature in its many connections with Italian music would require many articles. The aim here will be to indicate the importance of the Italian madrigal in the works of the three greatest English madrigalists—Morley, Weelkes, and Wilbye.

It is not surprising that Thomas Morley should be among the most Italianate of English composers. It was he who in 1597 brought out the collection: *Canzonets, or Little Short Songs to foure voyces. Celected out of the best and approved Italian authors*; and in 1599 *Madrigals to five voyces. Celected out of the best approved Italian Authors*. It is noteworthy, too, that an edition of his own *First Booke of Ballets to five voyces* was printed in Italy the same year as it

appeared in England (1595). It is to Marenzio that Morley owes his greatest debt, particularly in his madrigals and canzonets. Morley has captured the "delicious Aire and sweet Invention" of Marenzio and turned it to good account. The lightness and delicacy of melody, spirit, and texture which characterize one phase of Marenzio's madrigals, particularly his earlier books, have their counterpart in Morley, albeit with a distinctly English flavour. Moreover, the favourite technical devices of Marenzio are present in abundance in the work of Morley: the manner of approaching and continuing through intermediate cadences⁶; the texture and disposal of the voices⁷; the sudden change of movement from quick to slow (or vice versa) by juxtaposing passages in short and long note-values⁸ or by alternating passages in different metres⁹; and tossing about of a short motive from one voice to another.¹⁰ Striking parallels exist also between specific passages of the two composers. Many passages in Morley appear to have been inspired or even transplanted from corresponding passages in Marenzio.

In his ballets, Morley is under heavy debt to another Italian composer who was a favourite in England—Giacomo Gastoldi. Gastoldi was composer principally of balletti, a form especially popular in England. He possessed, moreover, a melodic sense closely akin to the English ideal of melody. It is worth noting, in passing, that the English of this period were particularly fond of setting words which carried no burden of thought but rather gave them an opportunity to expand musically. One has only to notice the frequency and obvious pleasure with which English composers set the fa-la in secular music and the words "Amen" and "Alleluia" in sacred music.

Next to Morley none of the great English composers is more indebted to Italian models for his inspiration and technique than Thomas Weelkes. And again, as in the case of Morley, the principal source of his Italianism is to be found in the madrigals of Marenzio. Unquestionably Weelkes is a greater madrigalist than Morley. It might be debated, indeed, whether it is Weelkes or Wilbye who excels all others. Weelkes surpasses Morley and all save Wilbye in the scope and magnitude of his musical conceptions. He is able, therefore, to capture a vein of Marenzio—his greatest vein, indeed—which Morley could not—his splendour and his grandeur. He is able to paint and to design on the grand scale, giving to some of his works a breadth comparable to that achieved by Marenzio himself. His phrases are often of a great length¹¹ and are spun out frequently by the typically Italian device of "concertante" voices.¹² This device, which Weelkes uses more extensively and more effectively than any of the others, produces a brilliance and a cogency of movement which is indescribable.

Although Weelkes could create canvases of small dimensions which are little gems of workmanship (e.g. the *Ayres and Phantasticke Spirites*), in his long madrigals he paints like Marenzio with broad, bold strokes which remind one

⁶ E.g. Fellowes' *English Madrigal School*, Vol. II, pp. 24-25, p. 78.

⁷ *Ibid.*, p. 48, 87.

⁸ *Ibid.*, p. 89, 93.

⁹ *Ibid.*, p. 55.

¹⁰ *Ibid.*, pp. 85-86.

¹¹ E.g. Fellowes' *English Madrigal School*, Vol. XI, p. 25.

¹² *Ibid.*, Vol. XII, pp. 13-16.

of a fresco of Tintoretto. An excellent specimen of his grand manner may be seen in his six-voice madrigal, *Thule, the Period of Cosmography*.¹³ The work is composed in two complete parts of great length and extreme brilliance; the delineation of the text is direct and powerful.

In his treatment of the text Weelkes is more than any other Englishman a follower of the Italians. His attitude toward the words is typical of the late madrigal in Italy. The character of the music changes constantly from phrase to phrase and even from word to word in order more forcefully to illustrate the meaning of the text.¹⁴ In the hands of a less able composer, this method may prove fatal to the continuity. As used by Weelkes, however, it produces a panoramic design intensely moving in its interest and vitality.

In still another respect, Weelkes goes farther along the road toward Italian style than any of his contemporaries. This is in the matter of chromaticism. The movement toward chromatic melody and harmony, so important in the development of the Italian madrigal, scarcely touched English composers. Here is one important respect in which England did *not* follow the lead of Italy. Nothing approaching the daring harmonies of Gesualdo, or even the less violent usages of Marenzio, ever came out of conservative England. The only partial exception is Weelkes, who, in his effort to achieve more passionate text-delineation has written some chromatic passages of exceptional beauty.¹⁵

The basis of John Wilbye's greatness is somewhat akin to that of J. S. Bach's. Like Bach, Wilbye uses the idioms, techniques, and forms of other composers but makes them completely his own. Like Bach, too, he uses certain typical figures, patterns, and procedures over and over in various works, but by the context makes them sound ever fresh and new. One finds in Wilbye more than in any other Elizabethan composer the combination of genius: invention which startles with its originality and at the same time convinces with its inevitability.

No other composer has set the English language with such skill and understanding. The quantities, accents, and meanings of the text are rendered not only accurately, but with such imagination as to make one gasp in amazement. Perhaps this is one of the chief reasons why the many characteristically Italian traits in Wilbye's music pass almost unnoticed, unless one is looking specifically for them.

In certain respects Wilbye is less Italianate than Weelkes, Morley, or certain other English composers. He carries with him always his native English feeling for melody. Even in passages which in construction are thoroughly Italian, the melodic content remains quite as thoroughly English in its song-like character, retaining something of the quality which makes Byrd's music a completely indigenous product. The melody is always "right" and

¹³ E.g. Fellowes' *English Madrigal School*, Vol. XI, p. 44.

¹⁴ E.g. the madrigal *As wanton birds*. Fellowes' Vol. XI, p. 51.

¹⁵ Mention of two madrigals will serve as illustration. One is *O Cave, Thou Wilt Despatch Me* (Vol. XI, p. 19), possibly Weelkes' finest work in the pathetic vein. The other is the moving three-voice madrigal *Cease Sorrows Now* (Vol. IX, p. 29).

natural, and always fresh. Two important results spring from this undercurrent of song-like melody. The first is that the abundance of text-illustration never breaks the continuity of the underlying movement. The sudden and complete changes of tempo and mood which are so startling and so dramatic in Italian composers like Marenzio and sometimes also in Weelkes, are rare in Wilbye. Even when he follows the text almost word by word with musical pictorialism he maintains a steady framework. The second result is that his music is seldom dramatic in the manner of contemporary Italian music. There is no hint, for example, in his *Second Set of Madrigals* of 1609 that opera had been "invented" some twenty years previously.

The Italian traits in Wilbye's music are in effect superficial. Yet in many particulars he shows Italian borrowings. His thematic material, his manner of disposing the voices, his use of "concertante" style, his harmonic progressions, his formal construction, his treatment of cadences, all betray his indebtedness to Italy for his raw materials. It is difficult to resist the temptation to say that he made better use of them than even the greatest of the Italians. The temptation must be resisted, however, for he made of them something entirely different from the Italians. It may seem to us more natural, more healthy, fresher and more profound. But it must be remembered that he was of, and was writing for, an entirely different society.

To carry on the examination of English madrigal music through the works of succeeding and lesser composers would be interesting and would bear out the conclusions already reached: that the English madrigal is a native product fashioned from imported materials. At a time of rising nationalism in England, English composers did not hesitate to borrow the materials and forms of an older and more highly-developed culture and turn them to their own advantage. The vigour of their own society enabled them to be debtors without being imitators. The freshness of the world in which they lived reflected immediately in their compositions. The result was an English art which has remained to this day the crowning glory of English music.

Review of Music

Delius, arr. Beecham: *Intermezzo and Serenade* from "Hassan". Full Score. (Hawkes and Son, Ltd.) 4s.

Sir Thomas Beecham's arrangement is by now familiar. In the *Intermezzo* the trombones and tuba of the original are dispensed with; in both *Intermezzo* and *Serenade* there is some slight rearrangement of the string parts, and some directions as to dynamics are added. This would seem to be an attempt to give effect on paper to the sort of interpretation which Sir Thomas Beecham would give in performance, and is welcome as such.

N. G. L.

Bruckner and the Symphony

BY

ROBERT SIMPSON

THIS essay attempts to elucidate Bruckner's structural principles and their historical origins, both in general and in relation to the fifth Symphony.

The first necessity is to mark the true extent and limits of Bruckner's debt to Wagner. The latter achieved for the first time a kind of music whose processes were slow enough to accommodate stage action. His success was due to his realization that he must abandon the classical way of handling tonality. When key is used dramatically, as in a Beethoven symphony, the action generally becomes so swift that the design completes itself far more quickly than could the most active of stage scenes. Wagner's use of key, therefore, becomes more colouristic than structural, and he relies upon his drama for the logic of his musical plans. He is thus enabled to give point to recapitulations of music which the hearer was absorbing perhaps two hours earlier.

That Bruckner was profoundly stirred by this discovery is undeniable. Consequently his symphonies have very little in common with the earlier classical symphony or that of Brahms. In this respect he was a pioneer, for he was the first to apply new constructional principles to nineteenth century pure instrumental music. The vague ghost of sonata form may be traced in his first and last movements, but its presence is the result of his clinging to its external symmetries, perhaps without realizing how different were the demands his instinct was fulfilling. To understand these new laws it must be seen that Bruckner was, in composing non-programmatic music on such a scale, forced to discover them for himself. He had lost, on the one hand, the classical way of viewing tonality, and on the other he had no aid from an external plot with stage action. Two simple methods of obtaining symmetry were denied him.

He took refuge in his marvellous faculty for building climaxes. This is the heart of his style and his peculiar symmetries arise from it. In spite of his ability to write a real quick movement (in the choral works and the scherzi of the symphonies, for instance), Bruckner is naturally at home in the slow gradual processes which produce his larger creations. In this element his climactic powers are most evident. In a way his forms are sectional, for he deploys great groups of themes in opposition to one another, constructing climaxes upon each with a wonderful sense of balance. Otherwise his designs are continuously wrought, for the only section of a movement with any sense of finality is the last. Key with him is less important than with Wagner; his modulation is kaleidoscopic. As Beethoven relies on key for his symmetry, and Wagner upon dramatic stage situations, so Bruckner is completely dependent upon the proportions of his great climax-building passages. In his finest *Adagios* he reverses the procedure in the "coda" sections and descends from a

mighty crisis by long slow stages to a finish of sublime calm. Thus his power is applicable in both directions. Absurdly simple as this seems, it is the secret of the appreciation of Bruckner. On so large a canvas, simplicity of form is essential, however complex the texture may be.

His instinct led him along the right lines, although it is apparent from a study of his scores that he was far from conscious perception of all his difficulties. Tovey has said that Bruckner's symphonies are based on mistaken principles in that there is in them a confusion between sonata forms and shapes demanded by the great time-scale. This is true. Where opinions must differ, however, is on the matter of how far the uncertainties disfigure the works, and how far they are harmless or remediable. It is strongly arguable that there are in the symphonies passages which are obvious insertions, the outcome of a feeling, perhaps subconscious, that without them the movement in question would lack balance. They are, almost all, examples of Bruckner's recourse to the outward features of sonata form when he felt the shapeliness of his design to be in danger. The questionable passages can nearly always be omitted with definite gain in coherence. These redundancies, and certain other minuter ones to be discussed next, are the sole blemishes in the symphonies. Their cure is usually simple, leaving noble examples of great art after the excisions. Not all the symphonies have need of this treatment. The sixth, seventh, and ninth cannot be touched without injury to their excellence.

The next difficulty is the avoidance of stiffness or even complete lack of movement when the music is conceived so enormous. However slow, music must either move or merely take up time. Here also is a matter which gives the hearer, if not Bruckner, serious trouble. The size and slowness of his processes is such that the pulse beats every four bars. Had Bruckner written his works in enormous bars four times the length of the existing ones it would have been easier to grasp his plan at sight. Understanding that Bruckner regards four moderately-paced bars as a unit, one can see an obvious danger in his attitude. The tyranny of the gigantic slow pulse can, as well as being a source of power in itself, cause stiffness if the composer's muse is not working at full pressure at every moment. Sometimes Bruckner will "mark time" for two bars by repeating the material of the two previous measures in order to complete a four-bar pulse. This is unnecessary inside so vast a structure, and a listener who is unable to follow the immensity of the design can find the effect occasionally very trying. Given sympathy and understanding, no one is likely to be put off by a couple of redundant bars here and there. In the great majority of cases the extra bars can be cut out with real profit to the cogency of the music, especially where there are two or more repetitive four-bar pulses together. In that case it becomes a simple matter of turning two pulses into one. The result is to avoid those minor irritations which most English critics are apt to magnify. They do not so much find genuine big faults in Bruckner as exaggerate their own reactions to the small ones. When the little flaws can be remedied so easily let it be done by all means. Critics and public will be happier without knowing why.

On of the most infuriating, perplexing, and fascinating of all critical problems

in music has been raised by the publication of two conflicting versions of Bruckner's symphonies.¹ No other music is the subject of so strange a controversy. Bruckner's naïve character is said to have been responsible for the ease with which he was persuaded to alter his works. His symphonies were first written in one form and then on the advice (good and bad) of his friends, were revised and recast. Only one, the sixth, escaped this treatment. The final forms of the works were eventually published, but Bruckner himself, for reasons apparently undisclosed, kept the earlier versions very carefully in manuscript. The fat was in the fire when, in the early nineteen-thirties, some of these earlier, so-called "originals" were published in Vienna. It was held by the publishers that Bruckner submitted to the wishes of his friends only because he believed his work would be more quickly heard and appreciated in the revised (and condensed) forms. Also they maintained that the alterations made in the orchestration of the symphonies were for the benefit of the orchestras of the day, as the standard of playing was not sufficiently high to make the "originals" practicable. Robert Haas, the editor, stated that now orchestras were capable of it there should be no objection to the performance of these earlier and, in his opinion, far superior editions.

To Dr. Heinz Unger I am indebted for the information that the revised scores of the works are in many instances far more difficult to play than the "originals". In view of this, one must naturally be wary of other fallacies which might be lurking in the minds of the publishers of the Haas edition. In support of the case against this particular misapprehension Dr. Unger points out that in the revised score (published in miniature and edited by J. v. Wöss) of the fourth Symphony many of the wind parts originally given to first oboe, first clarinet, first horn, etc., are there written for the second, third, or fourth instruments. This is true of all the other symphonies except No. 6 (the earlier form of No. 7 is still unpublished, and must therefore be left out of consideration). As many of these parts are difficult, and second, third and fourth players are not generally thus placed because of superiority to the "firsts", it is hard to understand how the revised versions could have been made for ease of performance. The scoring of the Wöss editions is more subtle and difficult to bring out than that of the Haas versions, for many passages formerly scored for a whole mass of brass in unison were rewritten and divided between individual instruments. The result is often smoother and more refined, but needs more skill from conductor and orchestra. For the purposes of this essay no more can be said about the alterations in instrumentation, except that the differences between the two editions are very extensive.

Still more interesting are the variations in the actual forms of the music. The earlier versions are invariably longer and almost always less logical than the revised shapes. There is, however, at least one important exception in favour of the Haas edition, to be found in the finale of the fifth Symphony. There can be no doubt that the cut in the recast score seriously upsets the balance of the

¹ See "Anton Bruckner: Simpleton or Mystic?" by Geoffrey Sharp, in *THE MUSIC REVIEW*, Vol. III, No. 1, February, 1942: pp. 46-54.

whole movement. The questions aroused here will now be discussed with the rest of the work. The following remarks must not be regarded as forming a thorough analysis of the music. They are intended to illustrate from a symphony which conveniently raises them, all the issues mentioned above. The reader is advised to obtain a miniature score (Wöss). To have both versions would be ideal. Bar numbers will refer to the revised score as being the more easily obtainable.

Bruckner's fifth Symphony begins with a vast introduction which sets the scale of the whole work. Sustained mysterious harmonies appear over a pizzicato bass, and are followed by a powerful burst of sound, as of trumpets in a cathedral. An excited *crescendo* and *accelerando* moves towards a climax, at which the original tempo is restored. The blaze dies away as if into a vault, and the Allegro starts at B (bar 55) with a quiet but supple theme in the basses. This receives a *ff* counterstatement (bar 79), and a long *decrecendo* leads to a new subject group (bar 101).

Bruckner's secondary groups usually range freely from key to key. This is no exception. After a fine series of themes this section reaches its climax at bar 205. From this it dies romantically away, and the introduction returns, with its alternation of mysterious quiet and grand bursts of tone. The second tutti gives rise to a resumption of the fast tempo and to mighty developments of the main theme, culminating in a great storm (bar 320).

So far Bruckner's instincts are leading him towards the building of climaxes rather than the orthodox establishment of sonata form. Vestiges of the latter are discernible, and in the main the action is fast enough to keep a sonata movement on its feet. But the key system would be diffuse for a good model of sonata style.

This big climax is suddenly interrupted by a chorale-like version of the first theme of the second group. It is impossible to resist comparison with the stilling of the tempest on the Sea of Galilee, so awesome is the effect. The solemn trumpet calls of the introduction return.

Now follows one of the passages which might be judged superfluous. After the brass chords there is a hush, from which a big *crescendo* leads to a restatement of the main theme in the official tonic. This section, from N (bar 348) to the bar before P (bar 381) inclusive, illustrates very clearly the kind of confusion which overtook the composer at this point. Compared as such with the previous climax, it is insignificant, as it has no adequate ancestry. It grows from no soil. The passage is there merely to pacify Bruckner's feeling that without it the movement would lose its symmetry. But symmetries demanded by music in this time-scale cannot be served by arbitrary sonata methods. Both the needs for formal balance and dramatic point would have been met had Bruckner proceeded directly from the solemn brass chords to a recapitulation of the second group with its climax. The first theme would then have been effectively reserved for the final climb upwards. As it happens, the join from the bar before N, to P, is very satisfactory (omitting the solitary E in what then becomes a silent bar before N), and to cut the whole passage results in a clarification of the essence of Bruckner's style.

Excising the section N, then, we come to a restatement of the second group in different keys. This is complete. When it has run its course, the first theme reappears in a really magnificent coda which culminates the movement tumultuously. In the orchestration there are many divergences between the two versions, but the form is the same in each.

Bruckner's full mastery is apparent in the slow movement, rich with his own peculiar religious fervour and serenity. Detailed description is not needed here, as no problems are raised during its course. The third movement, scherzo, is highly original, containing as it does a daemonic element in close opposition to simple rusticity. It is noteworthy that it begins with precisely the same notes as the previous movement. The trio is an extraordinary inspiration, full of light mysterious fantasy.

In its earlier form the finale is undoubtedly one of Bruckner's finest achievements. The logic of the revision is hard to discern. For where is the sense in stating a huge second group of themes and then abandoning it for ever? This is an outstanding case where knowledge of the first version is essential, and it is valuable to study both editions in parallel.

This Symphony follows the precedent of Beethoven's ninth in recalling fragments of previous movements before embarking on a design based on new material. Bruckner's method, however, is not quite the same. The successive appearances of the older themes are interrupted by an incisive figure formed from octave jumps. This figure eventually is taken up by the basses and turned into a fugue subject. A climax is then reached, and the fugal writing is abandoned as the music sweeps down to a point of rest on the dominant.

A lyrical second group begins in D flat major and goes through many phases of key and expression before being swept out of earshot by a massive tutti, based on augmentations of the octave figure. This strides across several pages, eventually subsiding into an impressive darkness. A moment of suspense, and then a striking chorale, gloriously harmonized, suddenly lifts the music into higher regions as it bursts out in the brass.

After poising for a few moments, Bruckner starts the great passage which is the core of the movement. This is a very powerful fugue, based on the first phrase of the chorale. Each entry of the subject is accompanied by a halo of beautiful counterpoints, none of which is used as a "countersubject" in the strict sense of the term. The fugue gathers momentum, is joined by the octave theme, and gradually approaches a great apex, passing through many mysterious developments. Some of the most wonderful of these are missing in the revised version, and to restore them is an absolute duty.

In the first-written score the fugue climbs to its big crisis, and there is a sudden decline into a state of hushed expectancy. Then the symmetry and spaciousness of the design are established by a most unexpected reappearance of the second group, coming as a welcome relief from the toils of fugue. The group is stated in full, followed by the grand architectural tutti as before. This in its turn generates energy for one of the greatest codas in any symphony since Beethoven. The chief theme of the first movement lends itself to the excitement in combination with the octave figure, and gradually an immense climax

is created, at the height of which the mighty chorale surmounts the entire work.

Now in the later version, the culmination of the fugue leads directly to the coda, the recapitulation of the second group being cut out. The form as it thus stands might be regarded as tripartite, with a disproportionately short middle section and an enormously elongated third part. Such an analysis hardly convinces the finer senses which demand some justification for the second group, too small for a middle section and too large to be ignored. In spite of its length the earlier form is undoubtedly right. Also its performance has a financial advantage, for, unlike the revision, it does not require an extra battery of brass to deliver the chorale at the end.

Before leaving this symphony an observation must be made that the finale contains a few small rhythmic redundancies. The first of these occur in the second group (and likewise in its restatement). The passage from bar 75-80 inclusive (revised score) would be much more fluid were its two-bar repetitions broken up by the excision of bars 78-79. Similarly bars 96-97 and 102-103 are a hindrance to the fluency of the music, having been obviously inserted to complete needlessly rigid four-bar groups. The removal of bars 133-134 (*poco rit.*), thus allowing the tutti to break in two bars earlier, seems a legitimate course. By this means a better sense of articulation is secured. This kind of cutting would clarify rather than interfere with Bruckner's thought. But no cut, however small, should be made in a Bruckner symphony without the deepest possible study, and the clearest understanding of all the principles involved in each individual case. One cannot generalize about cuts.

It cannot be too strongly urged that without long knowledge of this music its true value may not be assessed. This is not to say that it presents grave difficulties to the listener. On the contrary, the influences of the composer's mysticism, naïve sincerity, and Upper Austrian environment are all discernible at first hearing. The "atmosphere" of Bruckner's music is obviously compelling, and his sense of beauty easily understood. Each of his symphonies is a cathedral in sound. Given opportunity of establishing itself here, his work would undoubtedly do so by virtue of its universal qualities of grandeur and serenity, and of the great surge of rich humanity which permeates it all; while prolonged study reveals the depth and power of its art.

REVIEWERS

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Anglo-Austrian Musical Relations through the Centuries

BY

H. J. ULLRICH

THE War, which scattered peoples and dispersed armies all over the world, has brought the nations close to one another to an extent hitherto unimagined. It has also served to increase a mutual interest in cultural institutions and traditions. Assembled in England, which in this war became Europe's greatest harbour of refuge, are cultural, and in particular artistic, influences from all the European countries which for centuries took the lead in the musical world of Europe: and to a certain extent still do. England thus assumes the traditions of the eighteenth and early nineteenth centuries, when this country, thanks to its wealth and to its love of music, drew musicians from all over the civilized world, until the United States assumed this function.

A written account of the affinity between England and the great musical countries of the Continent therefore seems to meet a practical as well as a scientific demand. If an attempt is made here to give, as a fraction of the vast subject, a brief outline of Anglo-Austrian musical relations, an attempt which can lay claim neither to historical completeness nor to analytical precision, may it be looked upon both as the initial step in a hitherto unexplored field and as an act of gratitude towards an hospitable country, in which Austrian music has always stood in high esteem. The main difficulties, apart from those engendered by war-time conditions, arise from the fact that, up to now, no *Austrian* musical history worthy of the name has appeared. Even in the standard works of musical history, both English and German, the history of Austrian music is still treated as a local peculiarity of the common German development. Insufficient consideration is paid to its separate individuality, conditioned by so many influences peculiar only to itself, and resulting from connections with Italy and the Slav countries in the North and South, as well as the Magyar East. Austria, it is true, steals into the forefront of musical achievement with the Viennese composers, who, in spite of manifold connections with Germany, France and Italy, are only comprehensible when viewed as the heirs of an original Austrian tradition.

The self-sufficiency of the feudal states, the enormous difficulties which beset the traveller, and the total absence of a planned cultural policy necessarily gave artistic relations between medieval countries a sporadic and casual character, especially when geographically as far apart as England and Austria. The political feelings, too, which prevailed in the time of Richard *Coeur de Lion*, and which still found their echo in Shakespeare's day, may have stood in the way of artistic contacts.

In the Middle Ages both countries already possessed a considerable musical culture, which was partly centred in Austria in the Ducal court and in England

in the monasteries, universities and aristocratic homes. At the time when polyphony was flourishing in the Netherlands, England already possessed a master of world renown—John Dunstable—a musician whose peer the Austria of those days was unable to produce. Dunstable (1370–1453) was employed as private musician by the Duke of Bedford, who later became Regent of France and the husband of a Burgundian princess. He not only surpasses in importance his English contemporaries, but holds his own against the famous Flemings Dufay and Ockeghem. With Dunstable was forged one of the first, if not the first link between the two countries.

In the latter half of the fifteenth century Johann Hinderbach, secretary to Maximilian I, in later years Bishop of Trento and one of the greatest scholars of his time, had an extensive collection compiled of sacred and secular compositions from the masters of many lands. The purpose of this work, which incorporated seven volumes, was to hand down to posterity the most important creations of contemporary art. After Hinderbach's death this collection, together with his entire private library, became the property of the Dean and Chapter of Trento. In 1881 it was recovered by F. X. Haberl and was acquired by the Austrian Board of Education. The so-called *Trientiner Codices*, published by Guido Adler and now in the possession of Italy, contain, besides compositions of Dunstable, those of other English composers like Lionel Power, R. Markingham, Bedingham and John Bennet and certain anonymous pieces which are designated by the title "Anglicus" or "de Anglia".

Maximilian's marriage to Maria, heiress of Burgundy, brought about a closer association between the artistic circle of Austria and that of Burgundy, then the most highly developed in Europe. One may perhaps justifiably assume that this connection drew the attention of the "secretarius regius" to Dunstable, who also belonged in a certain sense to the Burgundian sphere.

In the early part of the sixteenth century Austrian musical life, concentrated in the Imperial "Hofkapelle" first at Innsbruck and later in Vienna, received an important new impetus. Maximilian, himself a trained musician, by enlisting the services of outstanding composers like Hofhaymer, Heinrich Isaak and Senfl, transformed his "Kapelle" into the chosen instrument for the national encouragement of music. These men worked as Court composers or organists and occasionally they also held the post of cathedral organist at St. Stephen's: as for instance Jakob Froberger in the seventeenth century. It is not surprising that these masters of the "Royal Instrument" not only themselves produced musical compositions for the organ, but also took a close interest in important contemporaries, whose works they endeavoured to safeguard by placing copies in the Hofkapelle library. In the Viennese National Library is a volume containing organ compositions of the well-known Dr. John Bull (1582–1628), who was organist of the Chapel Royal, Professor at Gresham College and one of the most famous organ virtuosi of his time. Against the wishes of King James I he went to Antwerp where, after turning Roman Catholic, he entered the service of the Spanish Regent and became cathedral organist. In view of the close connection between the Netherlands, ruled over by the Spanish line of Hapsburg, and Austria, the interest taken by the Viennese "Hofkapelle"

in the compositions of the organist of Antwerp Cathedral will be readily understood.

Of the other great Elizabethan composers only John Dowland, so far as is known, went to Central Europe, and even he tells only of travels to the courts of Brunswick and Hesse-Cassel. Neither Byrd, Gibbons, Morley, Tomkins, Wilbye nor Aston were ever in Austria. Nevertheless, it is quite possible that the English strolling players, who in the seventeenth century wandered as far as Austria and even reached Graz, where in 1617 an English troop received the title of "Hofkomoedianten" (Court comedians), brought with them to Austria many of the "madrigals, ayres and ballets" so beloved in their homeland. The presence of actors and managers like Green, Spencer and John Fasseyer bears out this theory.

In Elizabethan and Stuart times music played a considerable part. From many passages in Shakespeare we learn that it was closely bound up with the public and social life of the period. It was a part of a lady's education to play the virginal, of a gentleman's to be well versed in the lute and to be able to take part in a round or glee. With the Civil War and the subsequent Puritan government, the importance of music in England suffered a decline and, after a brief renaissance during the Restoration, the National musical creation reached a deadlock after Purcell's early death, attributable almost entirely to the triumphant arrival of Italian Opera. At the same time Vienna, ruled by Hapsburg emperors possessing unusual musical gifts, became the acknowledged musical centre of Central Europe. After the close of the Thirty Years' War came the Golden Age of the new art form, Opera, which had already been brought to Vienna from Venice in the reign of Ferdinand II. At the height of the Baroque Period the Opera, through masters like Sances, Bertali, Draghi, Bononcini, Ziano and others, reached a high level far surpassing in splendour, if less adaptable than the Venetian original. In England, on the other hand, the national opera, which had come into fashion towards the end of the Commonwealth, after attaining a brief perfection through the genius of Purcell, was almost completely supplanted in Court circles at the beginning of the eighteenth century by the Italian Opera at the Haymarket Theatre, built in 1705. In Vienna the Opera was the sole prerogative of the Imperial Court—show piece of a rich Baroque Culture—and entirely unknown and inaccessible to the ordinary citizen. The Opera in London was a costly, imported luxury and a centre of Court intrigue, but still within the reach of anyone able to afford the price of admission.

The rivalry which existed between Handel and Bononcini at the Royal Academy of Music is well known: the first enjoyed the patronage of the Hanoverian Court, while his rival was backed by the nobility, represented by Marlborough, Rutland and Sunderland. Anglo-Austrian musical relations were resumed through the Opera. Gianbattista Bononcini (1661-1750), one of the most prolific composers of the North-Italian School, settled in Vienna in 1691 and worked, first as 'cellist and later as composer of operas, for the Hof-theater of the Emperors Leopold I, Josef I and Charles VI, while from about 1700-1711 (the dates are open to doubt), he was established as Court Composer.

His opera *Almahida* was, until recently, held to be the first to be produced in London entirely in the Italian tongue, a distinction claimed for it by Charles Burney. From 1716-1727 Bononcini composed operas in London in opposition to Handel; until, becoming involved in the strange affair of plagiarism in connection with a madrigal of Lotti, he was forced to leave the city. More recent investigations however (Dr. A. Loewenberg) would seem to prove that the first all-Italian opera to be produced in London was presented at the Haymarket Theatre five years before *Almahida*, namely the Indian pastoral *Gli amori di Ergasto* by Jakob Greber (1705). Here too there is a link with Vienna. Greber, described by the encyclopaedias of music as of German nationality (Burney, however, also includes Haydn, Fux and Mozart among the "German" composers), lived in London from 1692-1705, when he went to Vienna where, according to Dr. Loewenberg, his *Ergasto* was produced in 1707 or 1708. The National Library in Vienna contains the manuscript of the opera with a new prologue in which reference is made to the presence of the bride of Charles VI (Eleanor Christine of Brunswick): the date of the Viennese production is thus a very probable one. The famous Niccolo Porpora (1688-1767) also went to London in 1729 to compete with Handel: returning later to Dresden and Vienna, where the youthful Haydn became his valet and pupil in singing and composition.

"The important thing is not where a poet was born", said Max Burckhardt once, "but where he received his poetic impressions." Why should this not also be the case with regard to musicians? Gluck passed the greater part of his life in Vienna, the city in which he wrote the decisive works on which his style was founded. We may, therefore, with a clear conscience, claim him as an Austrian, although he was born in Bavaria and educated in Bohemia. After his great operatic successes in Milan, he was invited to London, at that time the El Dorado of all musicians and the artistic Mecca of the world. Energetically he set to work, composing for the Italian Opera at the King's Theatre—but he was unsuccessful. Handel's cutting remark that his cook understood more about counterpoint than he, may have contained a fair grain of truth. Moreover, his performance in a London concert on the newly invented musical glasses can hardly have served to enhance his reputation in the city. Nevertheless, Gluck learned a great deal from his English failures: they gave him time to meditate his plans which—after many mistakes—were finally to lead to the great revolution of style in the Viennese and Parisian opera.

A stay in London was also to prove decisive for a greater figure than Gluck. The eight-year-old wonder child, Mozart, stayed in London from April, 1764 to August, 1765, and received as a virtuoso the plaudits alike of Court and public as well as an impressive pile of fine golden guineas. His acquaintance with the singer Manzuoli, the composer K. F. Abel, and most of all with Johann Christian Bach were of great importance: Bach's influence in the matter of style long remaining discernible. The brilliant reception which London had prepared for the child Mozart gained for the country the sympathies of the man who up to last year of his life still looked longingly towards England where, with the help of friends, he hoped to begin a new and better life. Chief among

these friends were several English musicians and composers, members of the large British colony which gathered in the Vienna of Joseph II and who maintained friendly artistic relations with Mozart.

Nancy Storace, the first "Susanna" in *Figaro*, her brother Stephen, a pupil of the master and composer of many operas and operettas, Michael Kelly, an Irish tenor and the first "Basilio", and finally Thomas Attwood, a young counterpoint pupil of Mozart's—all these, when they returned to their own country in 1786, promised to secure the master a living or at least a commission to write an opera in London. This hope never materialised, nor did an opera commissioned by O'Reilly in 1790. At the time of his death Mozart's work was little known in London. Twenty years had to elapse before his greatness was generally recognized and his popularity comparable with that of Haydn.

By the year 1770 the name Joseph Haydn was not infrequently to be encountered on English concert programmes, and only ten years later he was accounted a celebrity by Burney himself. In 1787 William Cramer tried to secure Haydn for the famous professional Concerts and at the same time his competitor Salomon despatched the publisher Bland to Esterhazy for the purpose of securing him for his own concerts. Both attempts were in vain, as was that of Gallini, the manager of the King's Theatre, who wished to commission an opera from Haydn. The composer had obligations in Esterhazy from which he could not and would not be released. But when in 1790 Prince Nicholas Esterhazy II died his successor disbanded the "Kapelle" and pensioned Haydn off: at once Salomon saw his chance. Post haste he sped to Vienna, presented Haydn with a magnificent offer, and succeeded in securing the master for a series of concerts in England. This was followed in 1794-95 by a second series, no less successful than the first. Haydn was showered with honours by court, nobility and public and went unchallenged as the greatest living composer. The world is the richer for Haydn's two trips to England which provided the inspiration for the twelve London symphonies, Haydn's most mature symphonic works, and his *Creation*, the stimulus for which he received at the London Handel Festival. The text for this last work was written by one Lindley and adapted from Milton's *Paradise Lost*. The opera *Orfeo*, which was intended for London presentation, was not performed owing to licence difficulties encountered by the theatre director, but Haydn set to music a number of English librettos: twelve canzonets, the chorus *The Storm* and the cantata *The Invocation of Neptune*, and also arranged Scottish and Welsh folk melodies for three voices.

Staying in London at the same time as Haydn in 1792 was his pupil Ignaz Pleyel (1757-1831). Cramer's professional concerts had engaged him as a star performer and as a rival to Haydn, but Pleyel refused to lend himself to the intrigue and the happy relations which existed between the two Austrian composers remained undimmed. Pleyel is to-day almost forgotten, yet in the eyes of his contemporaries he was a successful instrumental composer, and both Haydn and Mozart esteemed him highly.

Beethoven, in spite of often-repeated travelling plans, never came to England. But his sympathies for the country which, together with Austria,

constituted the stoutest bulwark against the Imperialism of Napoleon, are well known and found expression in such works as the variations on *God save the King* and *Rule Britannia* and the symphony *Battle of Vittoria*. For the Edinburgh publisher Thompson Beethoven arranged a number of Irish, Welsh and Scottish folk-songs. The Philharmonic Society in the year of its inauguration (1813) already included works of the master in its repertoire and acquired the performing rights of several of his instrumental works. In 1824 it commissioned from him his ninth Symphony, the MS. of which bears the dedication in Beethoven's own handwriting. The Society extended repeated invitations to the composer, asking him to come to England and write new works for their concerts. That these proposals came to nothing was due partly to financial discrepancies, partly to the natural aversion to travelling of a composer already sick and deaf. Up to the time of his death the close relations which existed between Beethoven and his English friends and admirers were maintained, laying the foundation for the great Beethoven cult in England, which is to-day experiencing a revival.

Schubert never went so far as to make travelling plans, and only after his early death did some of his songs become known in England. There is little doubt that he knew no English, but he was acquainted with the works of Ossian, Shakespeare and Sir Walter Scott in German translations.

Some of his most beautiful songs are set to the words of English poets, for instance *Sylvia*, *Hark, Hark the Lark*, *Anna Lyle* and *Norma's Song*. It is interesting to note that Schubert tried to publish the songs from Scott's *Lady of the Lake* in two languages, in order to make them better known.

The era of the travelling virtuoso, which began about 1780, naturally intensified musical relations between the two countries, in which Austria by no means played the leading part: rather was it England, with Muzio Clementi and J. B. Cramer, which assumed this role. Clementi (1752-1832), who from 1770 to 1780 had directed the Italian Opera in London, set out for the Continent in 1780 as a solo-artist, where he fought the well-known musical duel with Mozart at the Vienna Hofburg in 1781. On a later visit to Vienna Clementi made the acquaintance of Beethoven in 1807 and, as the author of *Gradus ad Parnassum* was held in high esteem by the master, who regarded him as the founder of a modern school of pianoforte technique. Clementi's pupil J. B. Cramer (1771-1858) also made frequent appearances on the Continent between 1788 and 1824 as a concert pianist. Beethoven praised him highly and used his studies in the instruction of his own nephew.

Another English virtuoso who crossed Beethoven's path was the mulatto George Bridgetower, or as Beethoven spelled the name "Brischdower". He was an eminent violinist, to whom was accorded the honour of accompanying the master at the first performance of the *Kreutzer Sonata* in 1803.

Very probably one of the first virtuosos whom Austria sent to England in this exchange of artists was the blind Maria Theresa Paradis, equally renowned as pianist, organist, singer and composer. Mozart, whose pianoforte pupil she had been, dedicated to her the B flat major Concerto K. 456. She appeared in

London in 1784 giving recitals at Court in company with the Prince of Wales and achieving great success.

Soon afterwards Johann N. Hummel (1778-1837) arrived in England as a twelve-year-old wonder child: he was also a pupil of Mozart and later of Clementi. In 1792 he took part in the Salomon Concerts, playing a Mozart concerto, possibly for the first time. He also made an appearance in Oxford. In Vienna he studied under Salieri and Albrechtsberger and belonged for some time to Beethoven's circle. The public regarded him as a successful rival of the master's in the art of free improvisation. In later years he also held the post of conductor of the orchestra at the King's Theatre. His pupil, Carl Czerny (1791-1857), was one of the most outstanding exponents of the "Vienna" School of pianoforte technique and at the same time a prolific composer of practice-studies for this instrument. His work still lives and is to this day put to practical use. His English tour, which was planned in 1804, but did not take place until 1837 because of political disturbances, won for him magnificent testimonials from Beethoven, whose pupil he had been. Czerny's contemporary, Ignaz Moscheles (1794-1870), also came from Austria and was, like him, a pupil of Salieri and Albrechtsberger. Moscheles, under Beethoven's direction, arranged the first pianoforte score of *Fidelio*. In 1823 he visited London as a professional pianist and in 1832 became co-director of the Philharmonic Society.

Another Viennese virtuoso, the violinist Franz Clement (1780-1842), came to London as a ten-year-old child prodigy, giving concerts under Haydn and Salomon. He also took part in a concert given at Oxford in honour of Haydn. In later years he held the post of leader at the "Theater an der Wien" in Vienna: and the score of Beethoven's violin Concerto bears the remark in the composer's handwriting: "Concerto per clemenza pour Clement, primo direttore al teatro a Vienna." The Salzburg pianist and composer Sigismund von Neukomm (1778-1856), to-day almost forgotten, also lived in England for some time, giving many successful concerts. He was a pupil of Michael and Joseph Haydn.

In the latter part of the nineteenth century the number of Viennese instrumentalists performing in London increased still further. The 'cellist David Popper, the violinist Fritz Kreisler, and the pianists Leschetitzky, Artur Schnabel and Moriz Rosenthal were frequent visitors to London. In the first half of the nineteenth century singers rarely undertook foreign tours, yet we find the famous bass singer of the Court Opera, Joseph Staudigl, in London as early as 1843, where he gave the first public performance of *The Wanderer*. In 1846 he successfully created the part of "Elijah" in Mendelssohn's oratorio at the Birmingham Music Festival.

After Schubert's death, Vienna lost for a generation its position as a musical centre of Europe. The rise of the Romantic and New-German Schools shifted the emphasis to Central Germany, while simultaneously the operatic hegemony passed over to France and Italy, later to Germany. Instead Vienna assumed the lead in the realm of dance music, a kingdom over which Johann Strauss (sen.), and Joseph Lanner reigned supreme. As early as 1837 the enterprising and restless Strauss ventured forth from France on a tour of Great Britain,

where preparations were being made for Victoria's coronation. The enterprise was an unqualified success, and soon the "Mohrenschaedel" (Moor's head), as his Viennese called him, was celebrating triumphs on a grand scale at Court, in the palaces of the nobility and in the cities of England, Scotland and Ireland. Strauss came to London a second time soon after the suppression of the Viennese revolution (1849), more famous than ever, but embittered by the political persecution he had incurred from the Greater-German Democratic Party on account of his principles as an Austrian patriot. A series of waltzes such as the *Homage to Queen Victoria*, the *Myrrh Waltz* and the *London Season Waltz* form lasting memories of Strauss' English tour. England had come into fashion with the advent of Queen Victoria and so Lanner, although he never crossed the Austrian border, wrote two works of homage, the *Victoria Waltz* (1839) and the *London Season Pot-Pourri* (1842).

Johann Strauss, the younger, visited London in 1867 on the invitation of the Prince of Wales, and moved the reserved English public to storms of enthusiasm with his *Blue Danube*. This Strauss, too, composed dance music for England: *Memories of Covent Garden*, a waltz based on English folk songs, and the *Festival Quadrille*, likewise founded on English melodies. Both form permanent memorials of his London visit, which the creator of *Die Fledermaus* always recalled with gratitude.

About 1875 Vienna once more assumed the lead in the field of instrumental music through Brahms and Bruckner. In the sixties and seventies Joachim, Clara Schumann, Julius Stockhausen, Fanny Davies, Augustus Mann and C. V. Stanford were already successfully working on Brahms' behalf. The performance of his *German Requiem* in London and Cambridge (1873) put the seal on Brahms' success. Three years later Cambridge University offered him the honorary degree of Doctor of Music, an honour which Brahms gratefully declined, mainly on account of his fear of public celebrations and of the sea-trip. By way of consolation he presented his newly completed first Symphony to the Cambridge University Musical Society. The work was successfully performed under the baton of Joachim, who soon afterwards was soloist in a triumphant performance of the violin Concerto in London. Since Hans Richter's connection with English musical life, the Brahms cult in England has spread far and wide, invoking enthusiasm hardly less than that accorded by the nation to Beethoven. Brahms' influence on English music is unmistakable, even if less powerful than that exerted by Mendelssohn and the Viennese classical composers. The relations between his great rival Anton Bruckner and England are definitely of a looser nature. In the summer of 1871 Bruckner, then Professor of the Vienna Conservatoire, represented his homeland at an organ competition held at the Albert Hall in connection with the World Exhibition in Kensington Gardens. He achieved considerable success with his famous free improvisations but left no lasting impression behind him, neither could his music find appreciation in England, although in 1877 and 1891 Hans Richter conducted the seventh and third symphonies respectively in London, and Bruno Walter repeatedly interceded in his favour, in 1935 for the last time, with the Vienna Philharmonic Orchestra. Bruckner's art, eminently catholic and

baroque, strongly emotional and with a definite Austrian bias, is not much to the taste of the English public. But even Gustav Mahler's symphonic work, so different from that of Bruckner, has not up to now found the recognition which it deserves. In 1892 Mahler paid a short visit to London as a young orchestra leader with a Hamburg opera company during the Augustus Harris season at Drury Lane. Preference is given to his song cycle, the *Song of the Earth*, the charming fourth Symphony and the simpler movements of the second and fifth Symphonies, all of which find a place in concert programmes, while his profound dissertations on God and the World, in particular the third, sixth, seventh, eighth and ninth Symphonies are as good as unknown.

As the nineteenth century drew to its close, the era of the travelling star-conductor was born. The first of the great Viennese conductors to find his way to England was Hans Richter, who had already made his London debut in 1877 with Richard Wagner. Two years later he founded the Hans Richter concerts, besides conducting Wagner performances at Covent Garden. After his final resignation from the Vienna Court Opera, he removed to England where he became conductor of the Hallé Concerts, at the same time retaining the leadership of the Birmingham Musical Festival. The distinction of Honorary Doctor of Music which Oxford conferred on him, shows the high regard in which he was held for the services he had rendered to English musical life. After him Austrian musical traditions were represented in England by Felix Mottl, Felix Weingartner, Bruno Walter and Bernhard Paumgartner, conductors respectively of the Vienna Philharmonic Orchestra and the Mozart Orchestra of Salzburg. Just now Austrian representatives of the conductor's art in exile include such men as Hans Gál, Hans F. Redlich and Karl Rankl. In exchange, Sir Adrian Boult and Albert Coates made frequent appearances in Vienna and Salzburg as guest conductors. The Vienna State Opera was represented in London by Lotte Lehmann, Elisabeth Schumann, Richard Mayr and others, while Irene Eisinger and Luise Helletsgruber sang at the Glyndebourne Mozart Festivals. Other Austrian artists who have often performed in England include Maria Olszewska, Lotte Schoene, Adele Kern, Desirée Halban-Kurz, Maria Elsner, Emil Schipper, Julius Patzak, Richard Tauber, Em. List, Hans Duhan, Karl Alwin, J. Pembaur, Friedrich Wührer, Paul Weingarten, W. Schneiderhan, Lili Kraus, Richard Odnoposoff, Emil Feuermann, Anny Ehlers, Peter Stadlen, Erika Morini, Heinz and Robert Scholz, The Rosé Quartet, the Konzerthaus Quartet, the Weiss Quartet, the Rothschild Quartet, The Mairecker Quartet, The Salzburg Mozart Quartet, the Viennese Boys' Choir and the Salzburg Trapp Choir. In the post-war years English artists too paid visits to Austria, partly in order to study in the land whose brilliant musical culture survives all crises, partly in order to interpret English and Austrian music in a form which elicited words of recognition from even the severe Viennese critics.

Not quite so satisfactory is the balance of the mutual exchange where musical composition is concerned. The important operatic composers of the Vienna School: Bittner, Korngold, Schreker, Wellesz, Grosz, Paumgartner are yet to be heard in England. A work of world-wide success, Alban Berg's

Wozzeck, and Hugo Wolf's *Corregidor* have only been performed in isolated instances in concert programmes. The more recent Austrian lyrical and instrumental music, both of a conservative style (Marx, Rinaldini, Weigl, Gál, Kauder and Paumgartner) and of a modern character (Webern, Schönberg, Alban Berg) is unknown or only occasionally heard. The more modern English music is still less known in Austria. Elgar, Delius, Ireland, Ethel Smyth, Bax, Holbrooke and V. Williams only rarely had the chance of speaking for themselves, and then not always through representative works. The younger generation of composers, like Bliss, Rubbra, Tippett and Britten, is unknown, apart from single performances in the concerts of the International Society for contemporary music.

Distinguished British students of music have repeatedly occupied themselves with Austria. Sir George Grove visited Vienna with Arthur Sullivan in 1867 in search of Schubert manuscripts and had the good fortune to discover the parts of the *Rosamunde* music. A second visit, which had to do with the preparation of his classic article on Schubert in Grove's *Dictionary*, led him to put forward the contested theory concerning the existence of the so-called *Gastein* Symphony—a theory which even to-day has a following in this country and has recently been supported by as eminent a scholar as Otto E. Deutsch. Men such as C. V. Stanford, Eric Blom, Cecil B. Oldman, Ernest Newman and lastly Edward J. Dent have each in his own field contributed much to the circulation and advancement of Austrian art in England. On the other side, Austrians as for instance O. E. Deutsch, Alfred Rosenzweig and the present writer have repeatedly occupied themselves with Anglo-Austrian music problems.

The cordial relations which were opened up during these years between British and Austrian refugee musicians will outlive the war. The stimulus created by the exchange of ideas, and the way in which many publishers and musical societies have promoted modern Austrian music, in particular, will not be forgotten and will bear fruit. On their return to a liberated homeland, Austrians will feel themselves in honour bound to work for a deeper knowledge of the masterpieces of British music and for their cultivation: moreover to destroy the legend, not yet extinct on the Continent, of England as a "land without music". This artistic exchange of ideas can have only the most gratifying results for the future state of Anglo-Austrian relations, serving to deepen and strengthen mutual understanding between two civilized and art-loving nations.

Review of Music

Elizabeth Poston. *The Stockdoves*. (O.U.P.) 2s. 6d.

This song is pleasant to sing and to hear, and the composer is to be congratulated on discovering a musical formula which sounds like the cooing of doves. But the music adds little to the poetry; there is no new entity. The piano gives a comment on each incident; the voice rises when the birds do, and the tune goes into semi-quavers with the rain drops. The effect, though, is of lack of roundness—of incidental music to a poem rather than of a song.

N. G. L.

Autumn Concerts

SUMMARIZING our impressions of the first half of the first post-war concert season we are happy to be able to draw the reader's attention to two orchestras of more than ordinary promise: the Hallé under the inspiring direction of John Barbirolli and the newly formed Philharmonia; while the City of Birmingham Orchestra has made some records with George Weldon which encourage great expectations. The London Philharmonic has given some fine performances with Sir Thomas Beecham, among which *The Walk to the Paradise Garden*, *The Dance of the Seven Veils* and Schumann's B flat Symphony (all in the Stoll Theatre) deserve special mention: there was also a shocking travesty of *Till Eulenspiegel*.

The B.B.C. Symphony Orchestra has oscillated between a dull lethargy (which had become chronic during the war years) and a periodic fiery insensitivity characterized by a technique among the strings which we have heard described as "bang and scrape". This orchestra, containing most of the finest players in the country, ought to be providing us with first-class musical "experience" at all its public concerts: that it can do so was proven when Sir Thomas wrung from it a perfect performance of *Le Rouet d'Omphale* and an invigorating re-creation of Berlioz' *Fantastique*. Even so, Sir Thomas' greatest personal triumph was achieved with the Philharmonia Orchestra in the Kingsway Hall, on 27th October. This small body of magnificent players responded to his every call for brilliance and finesse, with the result that we were given a Mozart concert which would have satisfied the most fastidious listener seven years ago and incidentally emphasized the strides which our other orchestras have to make if they are ever again to challenge the best that Europe and America can produce.

Before turning to the provinces we must record our gratitude to Dr. Heinz Unger for undertaking the Mahler fifth Symphony with the London Philharmonic Orchestra at the Stoll Theatre and also to Walter Süsskind and Maurice Gendron for the performance of Prokofiev's cello Concerto. The former, though diffuse and opulent, has many beauties and deserves more frequent performance, while the cello Concerto was shown to be one of Prokofiev's weakest works, relying too much on stock-in-trade figurations which do nothing to hide its melodic poverty. The playing was good enough to leave us certain that here is no masterpiece. The visit of the Paris Conservatoire Orchestra under its conductor Charles Münch was notable for a fine interpretation of Roussel's third Symphony and gave us a demonstration of the most effective way of playing Debussy and Ravel—British conductors please note.

Manchester is exceptionally fortunate these days in possessing the most improved and at the same time the most promising orchestra in the country. Such things do not happen by accident. In this case Mancunians have to thank the Hallé Committee for its inspiration in securing the services of John Barbirolli as permanent conductor. He is devoting himself with unflagging energy to building, or more accurately rebuilding, a fine tradition of orchestral playing in the city; judging by what we have heard he is succeeding beyond anything we had a right to expect. The performances of *Brigg Fair* and Strauss' *Don Juan* in Sheffield on 24th November were of a calibre London has not heard for many a year, while in Manchester three days later *Don Quixote* showed a unity of purpose and a determination to excel for which among London orchestras one looks in vain. The Hallé is not yet the perfect orchestra, but at the present rate of progress it may soon become so.

Our visit to Liverpool was a disappointment. Knowing something of the fine musicians who had joined the Liverpool Philharmonic Orchestra during the war years it was depressing to find that most of these had already left. Among woodwind and brass the intonation was not consistently reliable, while the behaviour of some of the string-players led us to suspect that they must have been admitted to the orchestra without audition. At rehearsal we felt that Louis Cohen had to work against odds to hold the musicians' interest which is the more unfortunate because Mr. Cohen is one of our few native conductors who can obtain really first-class results with an orchestra that is ready to co-operate. Under the circumstances the performances of Sullivan's *Di Ballo* and the "Great" C major Symphony were a creditable achievement.

G. N. S.

Reviews of Music

- R. Vaughan Williams. *Thanksgiving for Victory*. For soprano solo, speaker, chorus and orchestra. (O.U.P.) 2s.
Greensleeves. Part song adapted from an old air. (S.A.T.B.) (O.U.P.) 1s. 3d.
Fantasia on Greensleeves. Arranged for two pianos by Hubert J. Foss. (O.U.P.) 4s. (both copies)

Dr. Vaughan Williams is evidently going to make the most of the popularity of his orchestral setting of *Greensleeves*, now skilfully arranged by Mr. Foss for two pianos. The part-song adaptation is essentially only another version of the orchestral "Fantasia", which incidentally is neither a fantasia in any of the accepted senses of the word, nor entirely "on Greensleeves". The middle section has been omitted and various alterations have of course been necessitated by the new medium, but the basic texture remains. The main interest of the new version lies in the translation from orchestral to a *cappella* vocal terms; the opening bars have been done most skilfully, but here and there (e.g. the tenor part on p. 5) bits of orchestral figuration have been simply transferred undigested to voices. However, the piece is beautiful in any form, and doubtless innumerable choirs will be glad to have it in this.

The *Thanksgiving for Victory* is a more important affair. True, it is an "occasional" work, "written to order". But the occasion was a great one, Vaughan Williams has risen to it greatly, and the fact that the work was commissioned by the B.B.C. has affected nothing but its dynamic balance so that "for concert and church use certain modifications" (indicated in a prefatory note) "are necessary". This is not the greatest Vaughan Williams and the musical idiom does not reveal a new side to Vaughan Williams; like the Fifth Symphony, it returns to his earlier manner; but the technical problem of a speaking voice is tackled successfully, and the introduction of a children's choir ("real children's voices, not sophisticated choir boys") is highly effective. The music, often as direct and hard-hitting as Purcell, could have been written by no one else. It is simple and beautiful and imposes unity on what might easily have seemed a hotch-potch of words selected from the Bible, Shakespeare and Rudyard Kipling.

G. A.

Samuel Barber. *Second Essay for Orchestra*. (G. Schirmer Inc.) \$1.50.

This short piece, lasting about ten minutes, is an excellent contribution to the repertoire of modern orchestral works. I venture to predict that conductors and orchestras will take to it very readily. For it has the quality not often to be met with these days of being *genuine* orchestral music. What I know of Barber's orchestral works such as the *First Essay*, the overture *The School for Scandal*, and the *Adagio for Strings*, has greatly impressed me on that account. To which I would add an easy, fluent style and a particularly felicitous melodic invention. Barber is no pioneer and no experimentalist nor does he seem concerned with any topical "social realism" and *Zeitgeist* as some of his American fellow composers are. His *Second Essay* confirms this impression, showing a mind that is interested in giving a rounded and well-balanced form to ideas which, while perhaps not very significant in the strictest sense of the term, are most attractive and flow with natural spontaneous ease. Call them romantic if you like, with a modicum of astringency in them due to a few modern discords and an interesting polyrhythmic counterpoint. Barber's healthy but not reactionary conservatism also manifests itself in the formal layout which, clear-cut and succinct, is almost identical with the traditional sonata-form scheme: two subjects (the first a good example of the composer's gift for inventing themes in terms of the orchestra), a development with a most brilliant exciting treatment of a mercurial rhythmic figure from the first subject, and a shortened recapitulation crowned by an imposing coda. Altogether a work that for its matter and manner deserves a high mark.

M. C.

W. A. Mozart. *The Ten Celebrated String Quartets*. First authentic edition in score based on autographs in the British Museum and on early prints, edited by Alfred Einstein. Publications of the Paul Hirsch Music Library (Cambridge). Vol. 12. (Novello.) 31s. 6d.

Dr. Einstein's edition has been commented upon so widely, and its merits demonstrated so convincingly, by competent writers on the subject, that little seems to be left for further discussion. The startling fact, however, that ten of the most famous compositions of Mozart have recently been published in editions both of which claim to give for the first time the authentic text, may justify a few additional remarks.

Those of us who are aware of the lamentable state of many of the famous editions of the works of our great composers have stressed time and again that it is equally important for the editor of a musical composition to be trained in editorial method as it is for the classical scholar. He must consult all the available sources, the original manuscripts and all the early printed editions. He must give a text which can claim to represent the intention of the composer, he must fully justify his emendations in an *apparatus criticus*, and he must make it quite clear when he is introducing markings of his own which are not to be found either in the autograph or in the first printed editions. The publication of such a text is often preceded by laborious investigations into the sources, which may take the form of separate studies. No philologist would question the value of such studies, but too often the musician refuses to admit the necessity for further investigations once a work he considers worth performing is available in some sort of edition.

The new editions of Mozart's ten string quartets must have come as a shock to these musicians. Let us take the first bars of the Hoffmeister Quartet (K.499). It makes a great difference if one plays, according to the Eulenburg edition:



or, following Mangeot's edition of the parts (Schirmer, 1942) and Einstein's edition of the score (Novello, 1945):



Indeed, we can see from the "authentic" editions that the Eulenburg score gives an entirely wrong idea of the mood of the movement. The staccato strokes introduce an element of coyness by which the character of the movement is completely changed. Such a perversion is significant of the whole attitude to Mozart in the second half of the nineteenth century—and it would seem from modern interpretations of his symphonies the view is not yet outgrown—which saw in him the fortunate child of the "Rococo", the witty conversationalist of the eighteenth century drawing-room. This travesty is clearly exposed by Mozart's own words:

"Essi sono, è vero il frutto di una lunga e laboriosa fatica."

The question must now be discussed, which of the two "authentic" editions is to be regarded as the genuinely authentic version: that of Mangeot, based, as we read on the title-page, on the autographs in the British Museum, or that of Einstein, based on the autographs and the first editions. In the chapter on "Character and relationship of the two sources" Einstein rightly points out that Mozart corrected the proofs of the first print of the Six Haydn Quartets. The edition of these, therefore, can be regarded as authentic. The case of the last four quartets is different. Einstein makes it quite clear that it is doubtful whether Mozart himself corrected the proofs of the Hoffmeister

Quartet, and certain that he did not live to see the proofs of the last three quartets, dedicated to the King of Prussia (K.575, 589, 590). In editing these Einstein had to rely on the autographs whenever the correctness of the first printed edition was in doubt.

From the publisher's Preface to Mangeot's edition we see that the claim on the title-page "established from the composer's autographs", is not accurate, since Messrs. Schirmer abandoned Mangeot's plan of bringing out "une édition très simple, c'est-à-dire une reproduction exacte des manuscrits", and have included "retouchings (mostly dynamic marks) from the printed editions in a smaller type between brackets". In his most scholarly review of the Mangeot-Schirmer edition in volume IV of *THE MUSIC REVIEW* (pp. 137-138), C. B. Oldman has pointed out the discrepancies between Mangeot's plan to give a simple reproduction of the autographs, and Messrs. Schirmer's inclusion of the first prints without fully coordinating these divergent points of view. One example will be sufficient to illustrate the discrepancies. In the second movement of the last of the Haydn Quartets, K.465, we find in bars 6-8 of Einstein's edition the dynamic markings placed as follows:



In Mangeot's edition the *crescendo* starts in viola and cello at exactly the same notes, but in the first and second violins at the first note of the bar, which is obviously wrong. But is Einstein's edition correct in leaving the beginning of the *crescendo* in the cello on the third quaver, on *g*? In the corresponding place, bar 53, it starts on the fourth quaver, on *f*, together with all the other instruments. The latter marking seems to me to be more satisfactory for the first appearance of the passage also.

The greatest difficulty in arriving at a satisfactory rendering of the articulation is obviously Mozart's placing of the bowing marks, which, as Einstein points out, "is not always so consistent as to leave no room for doubt". There is, for example, a slur on the first bar of the first quartet which Einstein has rendered differently from the autograph and the first printed edition (see *Critical Report*, p. XVII). In the autograph, of which the facsimile is given on p. XV, the slur is put "over the whole of the second half-bar"; Einstein altered it "by analogy with bar 109" (it should be bar 108). But I cannot see the reason for the alteration. In bar 11 (second violin) and bar 12 (first violin) the slur is clearly drawn over the whole of the second part of the bar (*cf.* facsimile); in bar 15 (viola) the slur was first drawn over *f#e*, but afterwards corrected by Mozart and extended over the *e* (*cf.* facsimile). In Mangeot's edition the slur is printed according to the autograph, which, from the musical point of view, seems to me to be more satisfactory.



There is another point in which the two authentic editions differ: the marking of the staccato. Mangeot, referring to Leopold Mozart's *Violinschule* has pointed out that the dot placed beneath the slur means *portamento*, whereas the staccato stroke means *staccato*,

and he has rendered the staccato marking by a stroke. Einstein, on the other hand, makes it clear that Mozart's staccato stroke corresponds to our staccato dot; it can be kept in the original form but it should never be wedge shaped, since that would indicate a very marked accentuation. "This has worked incalculable mischief in almost all editions of Mozart's quartets, and in practice has done much to coarsen their performance." Einstein, therefore, has rendered Mozart's staccato sign by the staccato dot, and according to my view is certainly right in doing so. But, we may ask, after studying the *Critical Report*, if it is quite correct to call an edition which contains so many points still open to discussion an "authentic" one. I personally should call an authentic edition of the text one which was either based on the composer's autograph, or on the printed editions undoubtedly corrected and approved by him. Adopting this view we may say that the Mangeot-Schirmer publication fails as an "authentic" edition on the grounds expounded by C. B. Oldman in his review in vol. IV of *THE MUSIC REVIEW*. It would have achieved this aim if Mangeot's original plan had been carried out; in that case it would have been the authentic edition of Mozart's autographs, without his later corrections on the proofs of the six Haydn Quartets.

Let us now turn to Einstein's edition. We have before us a publication in which the editor has applied all the means of musicological technique in order to provide us with a correct version of the text, but in which, as he himself admits, problems still remain open to discussion, for example, the staccato dot (*cf.* p. IX l. 46ff.). I should prefer to call Einstein's work the first edition of Mozart's quartets to make full use of the methods of textual criticism, and one which should supersede all the editions hitherto in use, even those based on the *Gesamtausgabe*. Let us hope that after the appearance of Einstein's valuable work, the publication of indiscriminate editions of the works of the great composers will become an impossibility, and that the arbitrary agogic and dynamic marks introduced by nineteenth century editors will finally disappear.

E. J. W.

Gerald Finzi. *Five Bagatelles* for Clarinet and Piano. (Boosey & Hawkes.) 5s.

Mr. Finzi has never been a sensational composer; and one has been duly grateful for his obvious determination to be influenced by no mere fashions. It is too easy to garnish your common chord of C with an F# and Bb, progress to your common chord of G cleverly flavoured with an Ab and C#, dress up your harmony as counterpoint and be labelled breathlessly by the nitwits as "Most Interesting" (invariable comment of the dull on the dull). So one was glad of the unashamed lyricism of *Earth and air and rain*, thankful for the true care for the voices in the Bridges' settings. More recently the composer has been trying still further to banish all elements of the sensational from his music; the *Aria* in *Farewell to Arms*, for example, was diatonic in basis, melodic in inspiration. Yet it must be confessed that this simplicity was tending to degenerate into a mannerism: *Dies Natalis* and *Farewell to Arms* were much of a pattern, though one could forgive much for such smooth vocal writing. In these *Bagatelles*, however, there seems to be nothing left but the mannerism, and, lacking the fastidiousness that disguised the limitations of the style, the work stands as a perfect summary of the commonplace. Here, the individual characteristics of the composer's harmonic style are paraded to such a degree as to become clichés. There is a never-ending stream of major and minor sevenths, 9/8 and 7/6 suspensions, and rather cloying tunes with their leaps of the sixth and the octave; the final "Fughetta" is banal to the last degree. One hopes that this is a mere pot boiler; but it is certain that, without even closer self-criticism than he has yet undertaken, the composer is in danger of becoming a bore.

Lennox Berkeley. *A Festival Anthem* for chorus and organ. (Chester.) 4s. (Dedicated to the Rector, Organist and Choir of St. Matthew's, Northampton.)

The new association which has been springing up between the Church and music is an admirable thing. It forces the composer to work with small resources; it compels him to write music that can be sung by performers of no exceptional talent; and it gives him

both a definite purpose in writing and a known audience to write for. There are many composers at work to-day who could benefit from writing under such conditions: the composer should not have to rely on the discipline of his own inspiration (which demands a standard of self-criticism which many creative artists do not possess); it needs to be supplemented by some sort of external discipline; and it is useful that his works should be performed by and for amateurs—often the most ruthless yet level-headed of critics—rather than before one of the various composers' clubs which, for all their virtues, tend to become societies of gullible mutual back-slappers. So the products of this movement, good or bad, at least deserve attention.

Mr. Berkeley, it seems to me, survives the test with credit. He has accepted the limitations of his medium and has by no means been irked by them. This anthem is carefully constructed and fastidious in style; there is clear vocal writing and an organ part that aids continuity and makes its own comments on the words. At the same time, though the work is not very difficult technically, one never feels that the composer has needed larger resources or compromised with his inspiration. The discipline, in other words, has in this case been a spur. A few more works of this distinguished unpretentious type should send flying from Parish choirs' repertoires the dingy dirges on which so many have had to rely.

Lennox Berkeley. *Lord, when the sense of Thy sweet grace.* Anthem for chorus and organ. (Chester.) 7d.

This anthem, too, has quality: there is good stuff to sing here, and the composer manages to preserve musical continuity despite the square rhythm and regular stresses of Crashaw's verse. In two places, indeed, the voices are given an Elizabethan freedom of rhythm—excellent idea—but at the same time the organ beats out a regular 3/4 which turns the freedom into anarchy. Still, if never very moving, this short work is yet satisfying and in good taste.

Béla Bartók. *String Quartets Nos. 3, 4 and 5.* Miniature scores. (Boosey & Hawkes.)

The music of Bartók presents a problem in judgment: it "sounds nasty". Yet this difficulty is constantly evaded. One reads analyses in which the subtleties of Bartók's polyphony are pointed out; one talks with enthusiasts who eulogize the tautness of the composer's construction; one can take the score oneself and observe, unhearing, the transformation of themes, the complexities of rhythm, the combinations of canon and fugue. Yet the only relevant fact—how it sounds—is overlooked. That it is the only relevant fact should be obvious, for it is manifested in the two most common attitudes to Bartók's work which one meets, both of which are wrong-headed: on the one hand the attitude of violent aversion based fundamentally on impatience with a riot of dissonance; on the other the attitude of fervent partisanship springing often from admiration for the mathematics, coupled with mild astonishment (and hence some self-satisfaction) that the resulting noise can just be borne. Impartial judgment (if there is such a thing) is, therefore, extremely difficult; but it is altogether impossible unless one is clear at the start what one is judging. And in this respect one's attitude to Bartók's dissonance is of supreme importance. For Bartók's harmony is bound by no rules: there is no compulsion to avoid any interval; there is no perceptible scheme of "relative" discord; there is not even any veto upon the clichés of romantic harmony (in the first movement of the fifth quartet there is an effective climax on the reiterated chord of the diminished seventh!); each note has its own significance, each melodic line its own logic and independence. This is, after all, revolutionary music; and if Schönberg was the revolution's Rousseau, Bartók aspired to be its Napoleon,—while the rank and file, perhaps, crave for a Louis XVIII.

We must judge the music of Bartók on musical grounds, then; for either the composer was solely interested in the construction and did not care about or hear the sounds he wrote (which is unthinkable), or he wrote what he did because the sounds were a true

expression of his musical thought and feeling; and we can criticize the means where they are inadequate just as we would those of a Spohr or a Mahler. "Bartók meant this", we can say. "He has considered its implications in relation not only to the logic of its construction, not only to the horizontal movement of the parts, but also to the vertical combination of sounds. This is what he intended musically." And musically we can judge it. This is of course the only possible approach, and it is simply necessary to make it clear again since one hears so frequently the contradictory statements that "it is the spirit which is important, not the technique" and "it is the construction that matters; you must accept the harmony". Such ideas are sheer defeatism, strongly to be deprecated: and, accepted, would throw the critic out of a job.

The quartets under review seem to me to be uneven in quality. No. 3 I take to be almost entirely experimental, and, as Gerald Abraham has noted, the quartets which follow show a descent from this standard of dissonance. Most of the technical devices paraded appear again in the subsequent quartets, but are used for a more musical purpose than they here achieve. This quartet is wholly contrapuntal in conception, and to the intellectual strain which this imposes is added the aural difficulty that, paradoxically, there appear to be neither points of rest nor any feeling of movement. The work was no doubt useful in view of the composer's later essays in the form and is interesting in that respect; but, except in the bare Dorian tune of the second part (before it is swamped by canonic imitation) and in the alert fugato at the end of this part, I, personally, can find nothing of any musical significance. The 4th quartet is a different matter. To begin with Bartók seems to have been much more concerned here with the vertical aspect of the music. Thus, in the slow movement there are passages where long held chords accompany the melody, in the *allegretto pizzicato* chords dictate the harmony, and in the breathless second movement the sounds are atmospheric, almost impressionistic, even though the look of the movement on paper is linear. Further, in the more definitely contrapuntal first movement, despite the harrowing close intervals of the opening, pedal points give a feeling of progression from point to point, and interposed harmonic passages provide moments of repose. In result, however, the movement loses something in homogeneity and gives rather a jerky, disjointed impression. This quartet is more satisfactory than the 3rd: it has great nervous tension, and shows evidence of intense intellectual effort, but the result is musical achievement not mere experiment; the composer is still struggling against his material rather than working easily with it, but the fight is beginning to show results. Whereas in the 4th quartet the greatest tension is at the beginning, in the 5th the process is reversed; here, it is only in the bare last movement that the old struggle reappears. The other movements are not only "easier" than any in the two previous quartets, but also show a new spirit of tranquillity which Bartók did not fully develop until the magnificent finale of the 6th quartet. True, the message of the first movement is forceful enough, but it is couched in gentler language; and the sense of rest is more marked in the inner movements than ever before. At the same time, study of the score shows that the intellectual effort is no less than in the earlier quartets; but it appears to be less because Bartók's new mastery of his own material diverts one's attention from technical means to the artistic effect.

No one can prophesy what music will live and what die, and the fact that musicians agree as to the importance of these quartets is little guide to their possible longevity. If, however, the stream of music does lead, as many believe, in the direction which the revolutionaries have pointed, and if the amateur in music can float upon it as naturally as upon classical waters, then the life of these quartets is assured. If the opposite is true, if revolution begets reaction, and the stream is shown to be a backwater, then it is doubtful whether any but musicologists will make the effort a hundred years hence to plumb these depths. So we are back where we started; the question of technique is still an all-important one; but it is the attitude of the amateur not the professional towards Bartók's that will matter. However, these well-produced miniatures should at least help the amateur to make up his mind.

N. G. L.

Gordon Jacob. Concerto for Oboe and Strings. Full score. (Joseph Williams.) 1945. 30s.

Compare this score with the same composer's Clarinet Concerto *on themes of Tartini*. In each there is a similar mastery of technical resource, a similar brilliance in the writing for the solo instrument and a similar facility in bringing each movement to its appointed end before the attentive listener has had time to become bored. This threat of incipient boredom, which is more serious in the work for oboe than in that for clarinet, may perhaps afford a clue to the issue towards which we are driving.

Of what avail is any degree of technical achievement if every mite of the composer's ingenuity has to be employed to camouflage a complete dearth of melodic inspiration? The melodies in the Clarinet Concerto, Tartini's melodies, are for the most part frivolous and inconsequential—but they are melodies. We do not believe they were worthy to form the basis of a new concerto; but if a composer has no melodic imagination of his own—yet still feels the urge to compose—he is faced with two possible solutions: to borrow from another composer or to write what we used to call *Gebrauchsmusik*—utility music, about as attractive as any other utility product.

The latter is what Dr. Jacob has chosen to do in this Oboe Concerto. In performance it is effective and brilliant in its own brittle, hollow and empty fashion. For quality of manufacture and overall slickness it must have full marks: but we refuse to believe that Dr. Jacob is incapable of writing better music.

We should add that the score, of 48 pages, is much too expensive and ought to sell at half the price.

G. N. S.

A Case of Identity

Mr. Ll. S. Lloyd has drawn our attention to an unfortunate slip in the review of *Two Songs* by H. K. Andrews, which appeared on page 201 of our last issue. Our reviewer attributed these songs to Hilda Andrews, whereas they were in fact composed by Kenneth Andrews, of New College. We offer our humble apologies to both and hope that we have not caused either any serious inconvenience. [Ed.]

Book Reviews

Counterpoint and Harmony. By Edward C. Bairstow. Pp. x + 408. 2nd edition. 1945. (Macmillan: Stainer & Bell.) 21s.

This textbook was first published in 1937. Excellent and detailed as it is, one would have expected a second edition to include some reference to modern problems of harmony and counterpoint. A student taking the book as a basis for his studies might well be led to thinking that such things as linear counterpoint, bitonality, and the relative norm of dissonances are just so much transcendental moonshine unfit to be mentioned in a serious treatise. I for one question the necessity of re-issuing the volume in these days of acute paper-shortage.

M. C.

Essays and Lectures. By H. C. Colles. Pp. viii + 244. (O.U.P.) 1945. 12s. 6d.

Basil Maine on Music. Pp. 129. (Westhouse.) 1945. 8s. 6d.

Dr. Colles was always at his best talking about Mozart. With this in mind we turned at once to the twenty-five pages entitled "Mozart in Musical Life To-day", wherein are reprinted the three lectures he gave at the Royal Institution in 1942. More correctly these are three thinly clad skeletons, published from the author's notes which he amplified considerably in delivery and would probably have expanded still further for publication. Therefore readers unfamiliar with Dr. Colles' cast of mind may expect these three drafts to be sketchy and disjointed—and we shall not pretend that newcomers to his work will find it as rewarding in this example as in the two pages devoted to "Beethoven's Finales" which are an object lesson in concise expression within the minimum of space—but to the

many of us who remember the author's approach to his subject and how he always wanted his listeners to think for themselves, these pages will stand as a permanent reminder of a style in lecturing which otherwise we might have been in danger of forgetting.

The various essays, wide in scope and for the most part imaginative in treatment, are as representative of his writing from 1909 to 1943 as such a collection can be. Reading (p. 163) "The Ninth Symphony", we were reminded of the performance, under Bruno Walter's direction, which must have prompted the article: coincidence, perhaps, but more likely a tribute to Colles' happy facility for relating fine prose to music he had deeply experienced; one of the most important qualities which we should like to see developed among the colleagues he has left behind.

Maine on Music is the most difficult reading we have tackled in recent years: not because Mr. Maine is dull or abstruse—far from it—but because the paper on which the book is printed is so thin that it is difficult to distinguish the type from the blotchy grey background formed by the preceding or following page. Page 129, consisting of five lines, is one of the very few that are easily legible. What would be a serious shortcoming in any book is the more infuriating here since what one can read of Mr. Maine warms the heart with its stimulating provocation. Consider "The Control of Broadcast Music" (p. 13 *et seq.*). We have previously drawn attention to the tendency on the part of the B.B.C. Symphony Orchestra to play *mezzoforte* in perpetuity. Probably those members of the orchestra who have thought about it at all would say the criticism was untrue, or if true unfair because "Balance and Control" smooth out all the contours: a good debating point which nevertheless evades the fact that their playing often sounds nearly as drab and monotonous in a hall (Bedford Corn Exchange or the Royal Albert) as it does "over the air". Even so, every musician who listens to orchestral broadcasts at all regularly knows the havoc that balance and control engineers can create. Mr. Maine sets out our first requirement categorically—that the balancer must himself be a perfectly balanced blend of musician and engineer; otherwise how can we expect our sense of climax and dynamic release to remain *relatively* unimpaired? Fundamentally, of course, the whole principle of balance and control is one of compromise and entirely at odds with the latest radio and gramophone research which aims at "volume expansion", in other words at restoring the peaks and valleys which the controller has cut out. At this stage it is safe to say that there is no simple answer, but Mr. Maine's thoughtful essay crystallizes the position and indicates several points of departure for the engineer in his search for methods of improving his technique.

G. N. S.

Music in our Town. By L. B. Duckworth in collaboration with M. Bartlett-Hewitt. Pp. 32. (Cornish Bros.) 1945. 5s.

The Story of Music in Birmingham. By J. Sutcliffe Smith. Pp. 122. (Cornish Bros.) 1945. 12s. 6d.

Too much cannot be written at this stage about the work of our provincial orchestras; the parts of these two books which deal with recent history and live organizations provide the greatest interest and some stimulation.

The first-named tells the story of the magnificent modern Civic Hall of Wolverhampton with its two concert rooms of 2,000 and 700 capacities, each said to be acoustically "as perfect as modern science can make them". In addition the authors discuss a wide range of musical considerations, commercial and administrative as well as artistic. In the first two fields they frequently talk sense. The book serves two useful purposes; first it presents an object lesson to towns of similar size in what can be done by way of buildings and concert organization; secondly, and I think more usefully still, it reveals some of the pitfalls to be found in doing these things. The authors do not always recognize as such the pitfalls they disclose. As a matter of fact one feels that Mr. Duckworth, willy nilly, is capable of providing some. For instance, we are told that it was not until a certain artist played the *B flat minor Piano Concerto* of Tchaikovsky that they managed to fill the nice new concert hall! That is beautifully naïve. But later Mr. Duckworth insists that the

programmes of visiting orchestras should be vetted by a Town's Committee. This is wholly intolerable even for the useful purpose of avoiding "overlapping", and the conclusion that the vetting would aim at the inclusion, in each concert, of a work that would "fill the hall" for the sake of filling the hall—and for no other reason—is inescapable.

Mr. Smith's book ends with a plea for a decent hall in Birmingham. How very English! Wolverhampton has a hall and no orchestra, Birmingham has a fine orchestra and no hall. From what little I know of Birmingham, supported by what Eric Blom says in his foreword, I believe the book to be a well documented history of music in that city. Much of it makes engrossing reading. A piece of original Longfellowish doggerel on the subject of organs is a crude piece of irrelevant trash and helps to spoil what is, in many respects, an admirable essay.

These books cost too much; *Music in our Town*, though well printed and illustrated, is no more than a paper backed pamphlet.

The Stream of Music. By Richard Anthony Leonard. Pp. 366. (Jarrolds.) 1945. 18s.

This book is worth possessing by student and general reader alike. The former will find new information about more than one composer. The latter will be entertained by a clear and vigorous style and will acquire nothing that is nonsensical in any important respect. Mr. Leonard does not intend that his book should be mere biography, nor even that plus mere composer appreciation. He hopes to chart the whole stream of major composition by integrating the lives of some seventeen composers. He fails to do this; his dilemma is characterized by the fact that, of his picked men there is room for only a brief note on two, *viz.* Berlioz and Verdi, whilst Stravinsky, Richard Strauss, Mussorgsky and Schumann get extended treatment. But one does not quarrel with this. In each of the four cases one feels the better for having read Mr. Leonard and the strength of the book is in its original treatment of the chosen composers man for man.

Scholarly as the book is, there are a few peculiar lapses. I imagine Mr. Leonard must know that there is no such thing as "the science of harmony" which he discusses in the Bach chapter. Again, within the space of two pages, he makes a point of the stubbornness and independence of spirit which were part of Bach's character and uses the word "grovel" to describe the Master's approach to the Margrave. There is no departure from fact here, but we should be told either more or less than we are if a recognizable character is to emerge from the author's study. In the Haydn chapter the author pointedly dodges the relative importance of C. P. E. Bach and Haydn to sonata and symphony. He deserves to be criticized for this because, realizing some responsibility, he purposely juxtaposes these names and then perversely misses an important chance to do just what he set out to do, interpret one of the main features of musical development through the men who shaped it.

Mr. Leonard cedes to the Beethoven Sonata Opus 13 its proper stature and importance. He recognizes its affinities with the Mozart C minor *Fantasia*, but regrets that Beethoven does not solve the third movement problem with his Rondo. "It is", he says, "an eighteenth century rondo in a minor key". Of course it is; but it fits just as surely as the "nineteenth century" operatic recitative and arioso made to precede a "seventeenth century" exercise in fugue fits into the great Sonata Opus 110. It fits because Beethoven was consciously and joyously able to take forms which had been flogged beyond articulation in other hands and make them convey his message.

The portraits are magnificent. Almost all are unusual and all are authentic. The Kupelwieser drawing of sixteen-year-old Schubert is a thing of real beauty; the famous Haussmann portrait of Bach as a young man is finely reproduced. For an expensive book there are too many misprints and the end-paper chronology charts are so badly printed as to be neither decorative nor useful. J. B.

The Technique of Choral Composition. By Archibald T. Davison. Pp. xviii + 206. (Harvard University Press.) 1945. \$3.00.

Well known, at any rate, in America, as the conductor of the Harvard University Choir and the Harvard Glee Club, Dr. Davison writes with intimate practical knowledge

of almost the entire field of choral literature, drawing his numerous musical illustrations from scores as diverse as Chabrier's operas, Rossini's "Messe solennelle", Graun's *Der Tod Jesu*, Malipiero's *Princess Ulalia*, and Honegger's *King David*, from Hindemith, Fauré and Schumann as well as from the great classical and modern masters of choral writing, from the Requiems of Delius and Pizzetti as well as Cherubini's and Mozart's and Berlioz'. His somewhat startling assertion, that "the 'choral-minded' composers who flourished after the Golden Age could easily be counted on the fingers of both hands" therefore rests on a pretty solid basis of observation.

"From the close of the sixteenth century on, one discovers composer after composer who apparently had more than a casual interest in choral writing; their works often embody ideas of great beauty; the choral dress that clothes them, however, is routine and sometimes inept."

Choral technique is far less carefully studied, far less often successfully employed, than orchestral technique, contends Dr. Davison. Orchestrators may not all be Berliozs or Rimsky-Korsakovs, Holsts or Ravels, but "there are many more who approach these men in brilliance than there are choral writers who are rivals of Handel, Mendelssohn and Brahms".

So far one can endorse everything the author says. But he goes on to assert that "there is . . . a choral technique as expert and as subtle as that for the orchestra, and the management of it in its more skilful manifestations demands even greater ingenuity than is required in instrumentation": a very doubtful statement, based on the fact that choral resources are so much more limited in range, dynamics and colour than those of the orchestra. But while it is obviously true that it is far more difficult to produce variety of colour or specially brilliant or subtle effects with a restricted medium, composers may well retort that choral writing can, and *should* be, no more a matter of "effects" than writing for the classical orchestra, the orchestra of Haydn and Mozart; a choral composition that depends very much on "effects" is as damnable an offence against nature as a string quartet that depends over-much on effects. A choral work, like a string quartet, stands or falls by intrinsic musical quality; an orchestral work, as everyone knows, can maintain itself in a more or less perpendicular position by use of adventitious effects, effects that are only at the command of masters of orchestral technique. Let Dr. Davison produce one choral work in the whole vast repertory he knows that lives by sheer virtuoso exploitation of the medium, as Rimsky-Korsakov's *Spanish Capriccio* or Ravel's *La Valse* does! It would surely be paradoxical to suggest that the string orchestra has "a technique as expert and as subtle" as that of the full orchestra of which it is a part, though it may be true that it is much more difficult to write an *Introduction and Allegro* than a full-orchestral piece of equal brilliance. But Elgar's *Introduction and Allegro* is unique; when a composer drops wind, brass and percussion he thereby announces either that he is saying goodbye temporarily to brilliance, range of colour and so on, or that he is about to perform conjuring tricks. And what is true of the strings is even truer of the chorus.

It may seem ungrateful to labour this point of criticism against so good a book. But it is really a defence of the book, an explanation why, despite his knowledge and his good intentions, Dr. Davison has not been able to produce anything comparable with the orchestral text-books of Prout and Gevaert and Forsyth, to say nothing of Berlioz and Rimsky-Korsakov. What he can do, and does admirably, is to shower useful, practical advice—mostly in the nature of don'ts—and to give examples of those special colour-effects that the chorus *can* produce. The choral composer who reads this book will not be admitted to a wonder-world like that of the modern orchestra but he will get a great deal of sound advice on how to behave in the more limited and prosaic sphere of the chorus. It is a pity that his reading will be made harder by the author's habit of committing verbal atrocities (e.g., "polyvocal" and "polychoral") and never using a short word when a long one will do.

G. A.

Gramophone Records

Khachaturian: Concerto for Piano and Orchestra.

Moura Lympany and the London Symphony Orchestra, c. Fistoulari.

Decca K 1145-8. 16s.

There are too few good modern piano concertos for this recording to be other than welcome. Judged from the reaction of concert audiences in very recent times, it is already a popular work. So, a detractor has pointed out to me, are *Rhapsody in Blue* and the *Warsaw Concerto*. And there is no doubt about it; popularity in piano concertos amongst modern audiences is a dangerous attribute. The spell of Tchaikovsky, Grieg and Rachmaninoff still makes very strong medicine. The witch-doctoring of Holt, Pomeroy and Hylton has bemused all too thoroughly the ex-aborigine British public which is still by no means out of the darkling wood. So anything to break the spell is welcome; and the successful charm need not be great music. I do not think Khachaturian's Concerto is great music; but it has vitality, invention, is utterly unsentimental—the important point of departure from the works whose distinguished composers we have so far mentioned—and is thrillingly entertaining to anyone prepared to take his hair down with the composer.

The pick of the movements is the second. There is a tune of telling beauty; the piano part, though rather showy, fits in well with orchestration of considerable subtlety. In this movement the L.S.O. produce some of the loveliest wood playing to be heard on recent recordings. The first movement is fireworks; but it all seems sincere enough—as fireworks—and if the colours are laid on thick, they are spread with a sure hand. The cadenza is, musically, the best part and it must be said that Miss Lympany rises to it so that this also becomes the best part of her performance. I should imagine that no woman has ever hit a piano as hard as this lady does in the last movement of the work, unless, as often happens, the piano has suffered over-amplification at the expense of the body of the orchestra. Lack of balance spoils what is intrinsically a very interesting movement. I do not know why we should expect the third movement of a piano concerto to be a jolly, racy affair; but we seem to. This is the most darkly coloured movement of the work. There is a principal tune which Borodin might have written (he almost did!), used as the setting for some quite phenomenal rhythmic inventions. The tension towards the end is achieved by a battle of rhythms between piano and orchestra, producing an effect remarkable for the nervous reaction it evokes.

Apart from tonal maladjustments in the first and last movements, orchestra and pianist acquit themselves well and follow Fistoulari through some moments of very well controlled excitement. Whom to blame for the lack of balance I am not sure, but that apart, the recording is clear if somewhat unnecessarily noisy.

Tchaikovsky: Concerto No. 1 in B Flat Minor.

Moiseiwitsch and The Philharmonia Orchestra, c. Weldon; and
Chanson Triste, Op. 40, No. 2. Moiseiwitsch.

His Master's Voice C 3466-70. 20s.

Grieg: Concerto in A Minor.

Arthur Rubinstein and The Philadelphia Orchestra, c. Ormandy.

His Master's Voice DB 6234-6. 18s.

The simultaneous appearance of these two sets raises acutely the question of where the reviewer's duty begins and ends. I can think of several excellent reasons for neither of them having been made at all; but here they are—one wants to say here they are *again*—and as records, they must be treated on their merits. They have very few. The Grieg is incompetently played and not well recorded. It arouses, first, irritation at the recurring lack of understanding between soloist and conductor in matters both of tone and tempo; and then boredom of the kind that can only come from hearing an overplayed work performed to an insultingly low standard. In every department this set is inferior to

that made by Leslie Heward, Moiseiwitsch and the Hallé Orchestra on His Master's Voice C 3264-7.

Similarly, the Tchaikovsky does not approach the Columbia set, LX 681-4, made by Petri with the L.P.O. under Goehr.

Apart from the existence of several alternative recordings, this work will not, at this stage in its ubiquity, be acquired by many whose interest in the gramophone is a musical one. One can see for what, and whom, it is intended. This seems to put the newly formed Philharmonia Orchestra in their place. It will be a great pity if they *are* used regularly for this kind of hack work; better to disperse the many fine instrumentalists recruited so that they may go back to the whole time business of public music making. This recording will certainly not help their reputations. The tone throughout is thin and though the rhythms are taut enough, the attack is unsatisfying and a sense of climax rarely realised. Moiseiwitsch plays well enough; the strange tinny noises that come from his instrument towards the end of side four can be no fault of his, while the recording throughout is not as good as we have recently come to expect.

Those who followed what was the apparent intention of the Gramophone Co., and bought these issues for Christmas presents have done nothing for either music or the gramophone; they have merely fallen for not very clever commodity-marketing preceded by astute market research.

Tchaikovsky: "Eugen Onegin", Waltz from Act 2.

Boston Promenade Orchestra, c. Arthur Fiedler.

His Master's Voice B 9312. 3s. 3d.

Symphony No. 6 in B minor.

Philharmonic Symphony Orchestra of New York, c. Artur Rodzinski.

Columbia DX 1205-9. 20s.

Both these works are excellently played and recorded. One is very glad to be able to make the latter half of that statement. It has been difficult to see why, throughout the war years, American recordings should have been so consistently bad, and one hopes not to have to refer to it again.

Whether the records are worth having is another matter. If you have any stomach for the Waltz, this is the best recorded rendering I remember hearing, and if I were buying the Symphony I would give this first cheap-label recording a very careful hearing. As it happens, I can always stomach Tchaikovsky's dance tunes—more, I play them for pure enjoyment,—whilst I will at all times try to avoid hearing a Symphony. That is because, in spite of his self-confessed failure to solve the artistic problems of symphonic writing, Tchaikovsky succeeds all too well, for me, in invoking the spirit that urged him to try. What he had to say could only be said without pugnacity and without laughter. A symphony with no bones in its first movement and no scherzo at all is not a symphony. On the other hand, faced with the *scene-de-ballet* where all is make believe and characters different from himself could assert themselves in a highly mannered reflection of the real life he could, not know, Tchaikovsky is no longer hampered with restraint. He writes freely and deliciously. It is fortunate that when the present Tchaikovsky revival has died down like the first did, we shall still find joy in the work of a great craftsman who himself found true inspiration in life when it was played and loathed it only when it was real.

*Mendelssohn: Ruy Blas—Overture.**

City of Birmingham Orchestra, c. George Weldon.

Columbia DX 1223. 4s.

This score, which is as near as Mendelssohn ever got to effective drama, is so polished in style that only a perfectly polished rendering is of any musical interest. The thing

* Strongly recommended.

comes wonderfully to life in this performance and one is made to think again about the stature of Mendelssohn as a major composer for orchestra. That is saying a lot for a single performance of a work not fully representative. The recording is as full and sonorous as anything we have had lately from Columbia.

Mendelssohn: Introduction and Rondo Capriccioso.

Eileen Joyce.

Columbia DB 2179. 3s. 3d.

No reputable pianist can ever have offered to the public a worse performance than this. If Miss Joyce's not inconsiderable reputation is to survive she must find some certain means of avoiding this kind of debacle in future.

*Mendelssohn: Greeting and I Would That My Love.**

Isobel Baillie and Kathleen Ferrier, acc. by Gerald Moore.

Columbia DB 2194. 3s. 3d.

*Handel: "The Messiah"; Comfort Ye and Every Valley.**

Heddle Nash and The Philharmonia Chamber Orchestra, c. Maurice Miles.

His Master's Voice, C 3454. 4s.

Both these records are strongly recommended. Musically slight, the Mendelssohn duets must be perfectly performed to be pleasing in themselves. They are so here; not only are the voices beautiful but there is evidence of a rare understanding among the singers and the accompanist, neither a note nor a cadence being out of place.

Heddle Nash also sings finely in the Handel and is accompanied beautifully. One cannot criticize the record at any point.

*Handel: "Messiah," Recit. Thy Rebuke; Aria. Behold and See, and Recit. He was Cut Off; Aria But Thou didst not Leave.**

Webster Booth with City of Birmingham Orchestra, c. George Weldon.

His Master's Voice C 3430. 4s.

"Otho", Spring is Coming and Come to Me Soothing Sleep.

Kathleen Ferrier, acc. Gerald Moore.

Columbia DX 1194. 4s.

Unlike some other bifunctional singers, Mr. Booth is as much a success singing music as he seems to be in romantic *fol-de-rol* on the stage. This recording is very beautiful, and he should spare himself for art more often. In two short excerpts this singer shows that he has grasped the true drama of Christ's suffering with no less insight than did Handel. He teaches us that mere feeling is not enough. The "Otho" airs are also well sung. It came as a surprise to me to hear the opening bars of the "Hallelujah Chorus" in another context. The most widely renowned four-note sequence in all music is here used as the basis of a truly fine song. The little known work from which these airs are taken is "Ottone", an opera dating from 1722—if anybody cares apart from the gramophone people, whose labels get sloppier as the years go by.

Corelli: Gigue, and

Handel: Allegro from Sonata in F.

Reginald Kell, acc. Gerald Moore.

Columbia DB 2189. 3s. 3d.

It is true that these are arrangements and, incidentally, for an instrument that Handel had never heard, much less Corelli. But that was their loss, and Mr. Kell has gained for us two gay tunes which sound well enough the way he plays them. At the same time, if Mr. Kell's recent Mozart success *must* be followed up, the money will spin into E.M.I. coffers as easily to real clarinet music, of which there is plenty.

*Strongly recommended.

Haydn: "The Sailor's Song" and "She Never Told Her Love".

Elizabeth Schumann, acc. Gerald Moore.

His Master's Voice DA 1850. 4s.

After a five year dearth of Elizabeth Schumann records her admirers will probably have rushed to buy this one *sans entendre*. If they know good singing they will have been disappointed. There is no excuse for the bad diction which mars this otherwise admirable record except that Schumann is singing, as is right for Haydn's English songs, in English. That may account for it, but the fact remains that only because the words are very simple in the first song, and well known Shakespeare in the second, do we know what the songs are about. The tunes themselves are truly lovely and the recording is adequate.

Dohnanyi: "Pierrette's Veil", *Wedding Waltz*.

City of Birmingham Orchestra, c. George Weldon.

Columbia DB 2188. 3s. 3d.

This music is second-hand Richard Strauss. The second-hand article rarely wears well, and this kind of stuff has about as much future as an Edwardian ballad. The recording is uncommonly good.

Szymanowski: *Notturmo e Tarantella*, Op. 28.

Arthur Grumiaux, accompanied by Gerald Moore.

Columbia DX 1199. 4s.

If the violinist had any say in the choice of piece with which to make his recorded debut—which possibly he had not—he has done himself a grave disservice. One perceives that he has quite remarkable technique, but wonders if he has contributed anything to the weary character of what he plays or if it is bound to sound that way. It is possible to make a good record of a bad work, but the young Mr. Grumiaux should not have been asked to try and Gerald Moore should know better than to connive.

Paganini-Liszt: *La Campanella*, and

Albeniz: *Triana* from the Suite "Iberia."

Cyril Smith.

Columbia DX 1214. 4s.

Sooner or later, in their search for single-disc works for piano (of which there are many we could wish to see recorded) the makers will have tunnelled through the dead weight of mediocre show pieces and begin in earnest on the real literature of that worst-written-for of all instruments. Meanwhile, here are two more mediocrities, of which the Albeniz is by far the least offensive, each well played and recorded.

Robertson: *Arrangement of Belmont Hymn* and *All in the April Evening*.

Glasgow Orpheus Choir, c. Sir Hugh Robertson.

His Master's Voice, C 3462. 4s.

Every chorister, professional or amateur, now singing in Britain should be made to hear this record and every choir master to possess it. More nearly perfect unaccompanied singing has not been recorded. The record has one shortcoming—the weakness of the music; but it is still worth possessing and one hopes fervently that this is the first of an endless sequence of recorded performances by this great chorus master and his singers.

Delius: "Love's Philosophy", and
Harty: "Lane o' the Thrushes".

Isobel Baillie, accompanied by Gerald Moore.

Columbia DB 2178. 3s. 3d.

Miss Baillie's voice, especially in the upper register, is not reproduced well. The *Delius* song suffers most. The *Harty* is a charming thing, and it is a great pity that the record cannot be recommended. J. B.

Weber: *Overture, Euryanthe*.

National Symphony Orchestra, c. Rankl.

Decca K 1154. 4s.

Before this record was made Decca still marketed the standard version of *Euryanthe*, van Kempen's with the Dresden Philharmonic Orchestra on LY 6157. The position is unchanged. Van Kempen's performance is superior in every respect while his record captures the requisite atmosphere so lacking on this new disc. All of which leads one to enquire how near this "full frequency range recording" comes to what we really want. What do we want from a record? Surely, a reproduction of sound which shall be "alive": realism plus imagination plus deception on the part of the engineer if and when that is necessary to secure the desired result. A difficult combination of *desiderata* which may explain in part why really first-class records remain few and far between. We understand that "frrr" is intended to mean that all frequencies from 30 to 14,000 cycles are recorded to provide linear reproduction over this entire range when the record is used on a suitable machine. A frequency range of this order is obviously desirable because one can hear notes and overtones within this range in the concert hall; but concert hall acoustics are very different from those of an ordinary room and the effect of a sound coming out of a hole in a box is liable to be different from the effect of a roughly similar sound made by an orchestra. There is not space to discuss the problem further within this review, but the disparity between these two discs and the great superiority of the older one foster our belief that widening the range of frequencies recorded may not prove, by itself, to be the panacea for all gramophone ills which some enthusiasts appear to expect.

Sibelius: 2nd *King Christian Suite*, Op. 27. *Elegie* and *Musette*.*

City of Birmingham Orchestra, c. Weldon.

Columbia DX 1220. 4s.

These are two well turned trifles of which the second is given an outstanding performance. The recording is clean and well balanced.

Bartók: *Roumanian Folk Dances* (arr. Willner).*

Philharmonia String Orchestra, c. Lambert.

Columbia DX 1221. 4s.

Yet another arrangement of the dances which have been recorded previously by Lili Kraus and Yehudi Menuhin. The arrangement is effective and should appeal more especially to those who normally find Bartók's angular rhythms and jagged harmonies distasteful. Performance and recording are very fine.

Mendelssohn: *Overture and Wedding March**, "A Midsummer Night's Dream".

B.B.C. Symphony Orchestra, c. Boult.

His Master's Voice DB 6242-43. 12s.

The *Wedding March* is miraculous, played with a clean and vivid precision and magnificently recorded. The *Overture* is less satisfying; believing as we do that a tender romantic atmosphere is the first essential for this music, we have to confess that this version sounds to us much more like a chromium-plated nightmare. The overall effect is

* Strongly recommended.

as hard as nails and comparable to some of Toscanini's work with the N.B.C. Orchestra. The recording as such is very brilliant and reinforces the hard matter-of-fact quality of the playing. Technically the achievement is a fine one but we can find no sign of any love of music.

*Borodin-Glazounov: Overture, "Prince Igor" and
Berlioz: March, "Les Troyens".*

London Philharmonic Orchestra, c. Beecham.
His Master's Voice DB 6237-38. 12s.

A good performance adequately recorded, but not by any means comparable with Sir Thomas' finest pre-war records.

*Berlioz: Royal Hunt and Storm, "Les Troyens".**

London Philharmonic Orchestra, c. Beecham.
His Master's Voice DB 6241. 6s.

This is the finest record that has been issued since *The Planets*. The performance is electrifying, quite as elemental as Beecham's cataclysmic effort in the Albert Hall some eighteen months ago, while the recording captures faithfully almost all the subtleties of Berlioz' score and reproduces them with a remarkably wide range of both tone and frequency. In spite of the Chancellor's tax on Art which means that this disc will leave you a penny change from a ten shilling note, it still represents astonishing value and might well be selected as the finest record of 1945.

*Ravel: Daphnis et Chloé, Suite No. 2.**

Boston Symphony Orchestra, c. Koussevitsky.
His Master's Voice DB 6239-40. 12s.

There are two outstanding features of this set. First that for an American issue the technical quality is very good, and second that the playing of the Boston Orchestra can be held up as an example to all the orchestras in this country none of which, on present form, could come near matching it in a month of Sundays.

Beethoven: Sonata in C sharp minor, Op. 27, No. 2.
Solomon.

His Master's Voice C 3455-56. 8s.

The second movement is the most successful. The first is bathed in a cold lambent haze truly evocative of moonlight but less sympathetic to the spirit of Beethoven, while in the finale the Red Queen must have been encouraging Solomon to redouble his efforts in an ever more hectic form of St. Vitus' Dance. The recording is good on the whole with some distortion evident towards the disc centres.

Britten: Serenade for Tenor, Horn and Strings, Op. 31.

Peter Pears, Dennis Brain and the Boyd Neel String Orchestra, c. Benjamin Britten.
Decca K 1151-53. 12s.

Let it be said at once that this is a magnificent performance. The recording is patchy, in part very good indeed (e.g. the prologue and epilogue for horn), usually satisfactory, but liable to blast on climaxes which in any case seem to have been damped unduly. We confess to being out of sympathy with the nervy, tenorish world of this *Serenade* and are still clinging to the hope that one day Mr. Britten will write the great music his reputation leads one to expect.

* Strongly recommended.

*Hely-Hutchinson: Ruthless Rhymes for Heartless Homes.**

Olive Groves, George Baker and Instrumental Nonet, c. Hely-Hutchinson.

His Master's Voice C 3464-65. 8s.

On the lines of his own setting of "Old Mother Hubbard" in the style of Handel (which ought to be recorded) and of Bétové's *pastiche de Wagner*, the attentive listener to this sprightly music will discover pastiches de Mozart, de Schubert and, we think, d' Hely-Hutchinson as well! This delightful, unpretentious score abounds in melodic felicities and would form a fine tonic for dour appreciationists who can see no further than a second subject. The playing is very good, as is George Baker's singing; but unfortunately the recording could stand a good deal of improvement.

*Leoncavallo: La Mattinata, and**Puccini: Nessun dorma, "Turandot."**

Jussi Björling and orchestra, c. Nils Grevillius.

His Master's Voice DA 1841. 4s.

La Mattinata is rubbish, but Björling lends it a new lustre and makes it seem quite attractive. The record is worth buying for the sheer power and resource of his singing of *Nessun dorma*. Grevillius aids and abets and manages to make a point of his own at the end. Recording good.

*Michael Heming-Anthony Collins: Threnody for a Soldier killed in action.**

Hallé Orchestra, c. Barbirolli.

His Master's Voice C 3427. 4s.

This is music good enough to be considered on its merits without regard to sentimental associations. The comparison with Butterworth is hard to resist and can do no harm, though Wagner and Elgar do more to set the seal of romantic respectability on this very promising score. The performance has been very good, the recording adequate.

Offenbach: Overture, "Orpheus in the Underworld".

Detroit Symphony Orchestra, c. Karl Krueger.

His Master's Voice C 3431. 4s.

This performance is first-class in every respect and the record supersedes the older version by the London Philharmonic Orchestra under Constant Lambert (His Master's Voice C 3110). The recording is good, if a little rough on climaxes.

Nicolai: Overture, "The Merry Wives of Windsor".

Liverpool Philharmonic Orchestra, c. Maurice Miles.

Columbia DX 1201. 4s.

Very disappointing. A dull, lifeless performance given recording to match.

G. N. S.

* Strongly recommended

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